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Teaching twice exceptional children: Gifted with learning difficulties: Professional development and provision in a Montessori school

Elaine Lewis
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**TEACHING TWICE EXCEPTIONAL CHILDREN:
GIFTED WITH LEARNING DIFFICULTIES**

**Professional Development and
Provision in a Montessori School**

**E. Lewis
2004
M. Ed.**

TEACHING TWICE EXCEPTIONAL CHILDREN:

GIFTED WITH LEARNING DIFFICULTIES

**Professional Development and
Provision in a Montessori School**

Elaine Lewis B.A, Dip. Ed

A thesis submitted in partial fulfilment

of the requirements for the award of

Master of Education

at the faculty of Community Services, Education and Social Science,

Edith Cowan University

September, 2004.

EDITH COWAN UNIVERSITY

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ABSTRACT

This study seeks to investigate the teaching of gifted children in a Montessori school, with particular reference to gifted students with learning difficulties in writing. A review of the literature on the Montessori method of education and on provision for gifted children, shows considerable philosophical and practical overlap in these two fields. However, it appears that this theoretical overlap is not necessarily realised in practice. Furthermore, although considerable research has been conducted on the characteristics, identification and classroom provision for the gifted, very little has been undertaken on the actual provision for gifted children in Montessori schools or gifted children with learning difficulties in writing.

Research indicates that appropriate teacher development is an important component of provision for the gifted. Within an action research context, all twelve teachers at a school participated in professional development on the gifted. They were provided with current information about attitudes toward the gifted, theories and models relating to giftedness, as well as curricular and instructional modifications for gifted primary children. The teachers' perceptions about the gifted were examined, by the administration of an attitude scale and through an interview process, before the professional development and again after they had the opportunity and support to implement program modifications.

To obtain a more detailed understanding of what was happening in classrooms, observation sessions were conducted. Data was also collected from parent feedback, informal observations, document searches and the researcher's reflective journal.

The research found that the teachers indicated, overall, positive attitudes toward the gifted. However, contrary to evidence in the literature which suggested positive attitudinal changes in teachers after professional development, the teachers' attitudes towards the gifted remained the same, overall, throughout the study. Despite this lack of measurable attitudinal change, the teachers enacted practical, behavioural modifications to their gifted students' programs after professional development. Positive outcomes for teachers and gifted students were generally obtained. Nevertheless, teachers expressed reservations about the effectiveness of

their interventions for the gifted, particularly those with learning difficulties, with reference to these students' ability to 'work independently'.

Implications that arise from this research relate to issues influencing the identification and provision for gifted students with learning difficulties. Additional implications were presented for school administration, teacher development, methodological issues and the need for further research.

DECLARATION

I certify that that thesis does not, to the best of my knowledge and belief:

- i. incorporate without acknowledgement any material previously submitted for a degree or diploma in any institution of higher education;
- ii. contain any material previously published or written by another person except where due reference is made in the text; or
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Dated: _____

21st January 2005

ACKNOWLEDGEMENTS

I wish to dedicate this thesis to my mother, Nell Johansen ... for living her life in the pursuit of wisdom, understanding, knowledge and excellence; and for lovingly supporting children amidst whirlwinds of difficulties.

I would like to express my sincere gratitude to my supervisor, Dr Marion Milton, for her guidance and support in helping me complete this research and aspire to excellence in the production of this thesis.

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I would like to acknowledge the support of my family in this endeavour. I wish to thank my husband, Chris, and my children, Andrew and Karen, for their support and encouragement to pursue my goals.

Finally, I wish to thank the teachers who gave up so much of their time to assist me. Thanks also to the children who contributed to this study. I acknowledge the assistance of the Principal, and the Management Committee, for permitting me to conduct the research in the school. Without their cooperation, this research would not have been possible.

Elaine Lewis

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CHAPTER 1

INTRODUCTION

1.1 Background to the Study

Teaching twice-exceptional children, that is, those who are gifted and have learning difficulties or some other special need/s, is a major challenge for classroom teachers (Warshaw, 2003a). This study investigated teachers' attitudes toward gifted children, as well as classroom provision for these students, especially those who were twice-exceptional. The setting for the research was a Western Australian independent school, operating within the Montessori system of education. There are many theoretical overlaps between provision for the gifted and Montessori education (Loeffler, 2001). However, this high degree of theoretical overlap does not always appear to be reflected in the classroom. This research examined Montessori teachers' attitudes toward the gifted and associated provision issues, before and after professional development on giftedness.

The present study's focus on gifted education needs to be viewed within the broader Australian educational context. In Australia there is an urgent need to improve educational provision for gifted students (Capp, 2002; Focus on gifted children urged, 2001; MacDonald, 1999). The last Senate Committee Report on gifted education in Australia detailed many recommendations to facilitate this process (Parliament of the Commonwealth of Australia, 2001). The Committee outlined numerous areas where improvements needed to be made in the field of gifted education. From these areas, teacher training, in the form of professional development, as well as identification and provision for the gifted, were the aspects that this research aimed to address.

As a support teacher at a Montessori primary school, my interest in this area grew out of my work with students who were experiencing learning difficulties or were underachieving, yet seemed very bright. I reflected on whether these same children were also gifted. No formal identification procedures were in place and no written policy existed to guide actions to be taken.

To assist in the clarification of the situation, I observed and reflected on these seemingly bright, yet under-performing students. During the two years prior to the research, the following observations on provision for these students, and their learning approaches, were made at the school:

- The existing informal guidelines for the identification of gifted students were too narrow. Very high performance on standardised tests was required for selection in extension programs.
- The school's adoption of Multiple Intelligences theory (Gardner, 1993) was not included in its guidelines for the identification of gifted students.
- The existing guidelines for the identification of gifted students overlooked twice-exceptional children, that is, those gifted students also experiencing learning difficulties or other special needs, as well as underachievers.
- Some gifted students' "work culture" was self-limiting. These students joined with their class mates expressing opinions like "I just want to complete the required work", not choosing to do anything that appeared to involve extra effort. They seemed to have adopted the "least work is good enough" attitude and were typically not engrossed in their work, consistently looking forward to "free time".
- Some adult members of the school community were satisfied that gifted children would progress well without further provisions for their educational development. This attitude appeared to be related to the following issues: the 'alternative' school aspect of being a Montessori school; the focus on the 'whole' child rather than predominantly on academic subjects; and an acceptance of non-supportive Australian social attitudes toward the gifted (Parliament of the Commonwealth of Australia, 2001).
- Staff and parents promoted co-operative learning and some discouraged participation in competitions, such as State and National creative writing, science and mathematics competitions.

So, it seemed that there were gaps and problems in the identification of, and provision for, twice-exceptional students in this particular Montessori setting that needed to be addressed. Twice-exceptional children are a recognised, hidden, under-served, sub-group of the gifted (Fox, Tobin, & Schiffman, 1983a; Ivicevic, 2004;

Kyung-won, 1990; Neumann, 2003; Starnes, Ginevan, Stokes, & Barton, 1988; Whitmore, 1988). A review of the literature suggested that this was a common situation in all school systems (Archambault et al., 1993; Association of Independent Schools of Western Australia, 2003a; Bartak & Fry, 2004; Taylor, 2001; Whitton, 1997; Wibowanto, 2003). Some research on twice-exceptional children has been reported in the literature, however no studies could be found of such a group in the Montessori context.

1.2 Significance of the Study

It was anticipated that this study would provide a useful contribution to education because it embraced a number of areas that have been neglected:

- Research on teacher professional development on giftedness in a Montessori pre-primary and primary setting.
- Research on gifted students in multi-aged group classrooms.
- Research on twice-exceptional children, in particular, gifted students experiencing learning difficulties in literacy.
- Australian studies of provision for gifted students.

Need for Research on Staff Professional Development in a Montessori Context:

Problems have been indicated with provision for some of the gifted in a particular Montessori school. Anecdotal evidence suggested that the teachers had undertaken little formal training in the education of the gifted. Furthermore, the school did not have an explicit policy to guide provision for gifted and talented children. The principal and some teachers at the school were concerned about this situation. The research topic for the current study was then discussed with all staff and they agreed to participate in a professional development program on the gifted, and work together to develop a policy. Such a policy would define, specify identification procedures and the means to provide for gifted and talented children in the school. In order for the professional development to be effective a number of

researchers indicated the need to use a model of teacher change (Goodrum, Hackling, & Pennic, 2001; Hall & Hord, 1987; Richardson, 1994b). This process of teacher change in a Montessori setting was expected to contribute valuable information that would enable improved provision for the gifted, as well as increased understanding of the application of the teacher change model (see Chapter 2).

Need for Research on Gifted Students in Multi-Age Group Classrooms:

Montessori classrooms are multi-aged groupings, known as MAG classrooms. This means that the children in a Montessori class are of mixed chronological ages, that is, in the junior primary class for example, children's chronological ages may range from six to nine years. However, MAGs occur not only in Montessori classrooms, but also in some State and other independent schools in Australia (Aussie Educator, 2004; Marland, 1993). There has been some research conducted on gifted children in multi-age groupings in non-Montessori settings that suggest positive outcomes for students where teachers provide developmentally appropriate, differentiated, curricula (Holloway, 2001, 2003; Lloyd, 1997, 1999; Rogers, 1989). The findings of the current research may inform not only Montessori schools but also other school systems that include MAGs.

Need for Australian Research on Gifted Students with Learning Difficulties:

It has been recognised in the international research literature that some gifted students may also experience learning difficulties (Cline & Schwartz, 1999; Fox et al., 1983a; Kyung-won, 1990; Ray, 1997; Silverman, 2003b; Starnes et al., 1988; Warshaw, 2003a; Whitmore, 1988). However, little research has been found on the identification and provision for twice-exceptional students in Western Australia, or in the broader Australian context, particularly relating to learning difficulties (Ivicevic, 2004; Munro, 2002b, 2002c; Stewart, 2002). Furthermore, of the research found, both historical and current, the focus has predominantly been on learning issues related to social disadvantage or emotional differences, rather than learning difficulties as defined in the present study (Alsop, 2003; Casey, 1981; Chaffy, Bailey, & Vine, 2003; Deschamp, Robson, & Nash, 1981; Harslett, 1992, 1996; Shean, 1983). For instance, in the 1970s and 1980s, Casey (1981, p. 75-76) studied

the teaching of children with special needs in Western Australia, and stated that disadvantaged gifted children were "really the product of an inhibiting environment and not of an inherent limitation". Gifted children and children with learning difficulties were viewed as two separate categories of students. Other studies have investigated gifted aboriginal children (Chaffy et al., 2003; Harslett, 1992, 1996). A more recent example involves a study that analysed data from 535 children at the Australian Foundation for Children of High Intellectual Potential, to identify patterns of emotional asynchronous development (Alsop, 2003, p. 118). Here twice-exceptionality linked giftedness and emotional development. Only in the last few years in Australia, has there been growing research interest in gifted children with learning difficulties (Ivicevic, 2004; Munro, 2002b, 2002c; Stewart, 2002). Thus it was anticipated that the present study would contribute to Australian data on this neglected aspect of twice-exceptionality, that is, gifted children with learning difficulties in literacy.

1.3 Purpose of the Study

This research examined Montessori teachers' attitudes toward the gifted and classroom provision for these students. The teachers participated in professional development on giftedness led by the researcher, and their perceptions about the gifted were studied before and after professional development. The initial professional development was followed up by ongoing curriculum and resources support by the researcher. The impact of the professional development and associated support on the teachers was investigated to determine any changes in their attitudes and teaching practice, over the period of a year. Within the classroom teaching component, classroom provision for the gifted focused on those gifted students who experienced learning difficulties in literacy, specifically in writing. These gifted children were investigated because they were of particular concern to their teachers. Thus, findings in this research will contribute new knowledge in the field of gifted education, in Montessori and multi-age group settings in particular, as well as providing Australian data on provision for twice-exceptional children.

1.4 Research Questions

The particular questions addressed by this research were:

1. What are the attitudes of teachers toward gifted children before professional development and after a period of enactment? Do teachers' attitudes change?
2. What modifications, if any, are made to gifted children's programs and teaching strategies after staff professional development?
3. What are the outcomes for teachers and students one year after professional development and practical support?

1.5 Theoretical Framework

The theoretical framework outlines the known issues influencing the research scenario and the relationship between those issues. As shown in the diagrammatical representation of the framework, Figure 1-1, the focus of the research was on gifted and talented children at a particular Montessori school. At this school there was recognition of the need for staff professional development in the area of gifted education, despite staff already having a philosophical commitment to enhance all children's multiple intelligences (Gardner, 1993). This framework was informed by the latest reports and research in gifted education and through school-based observations and reflections. Issues influencing attitudes toward and provision for the gifted were thus identified within the school. These issues were:

Montessori Philosophy

Montessori education philosophy focuses on the needs of the whole child and directs teachers to follow the individual needs of each unique child (Homfray & Child, 1999; Loeffler, 2001; Montessori, 1964, 1965, 1966, 1984; Montessori Teacher's Association, 2002; The International Montessori Index, 2004). For more detailed information on Montessori philosophy, teacher training and teaching see Chapter 4.

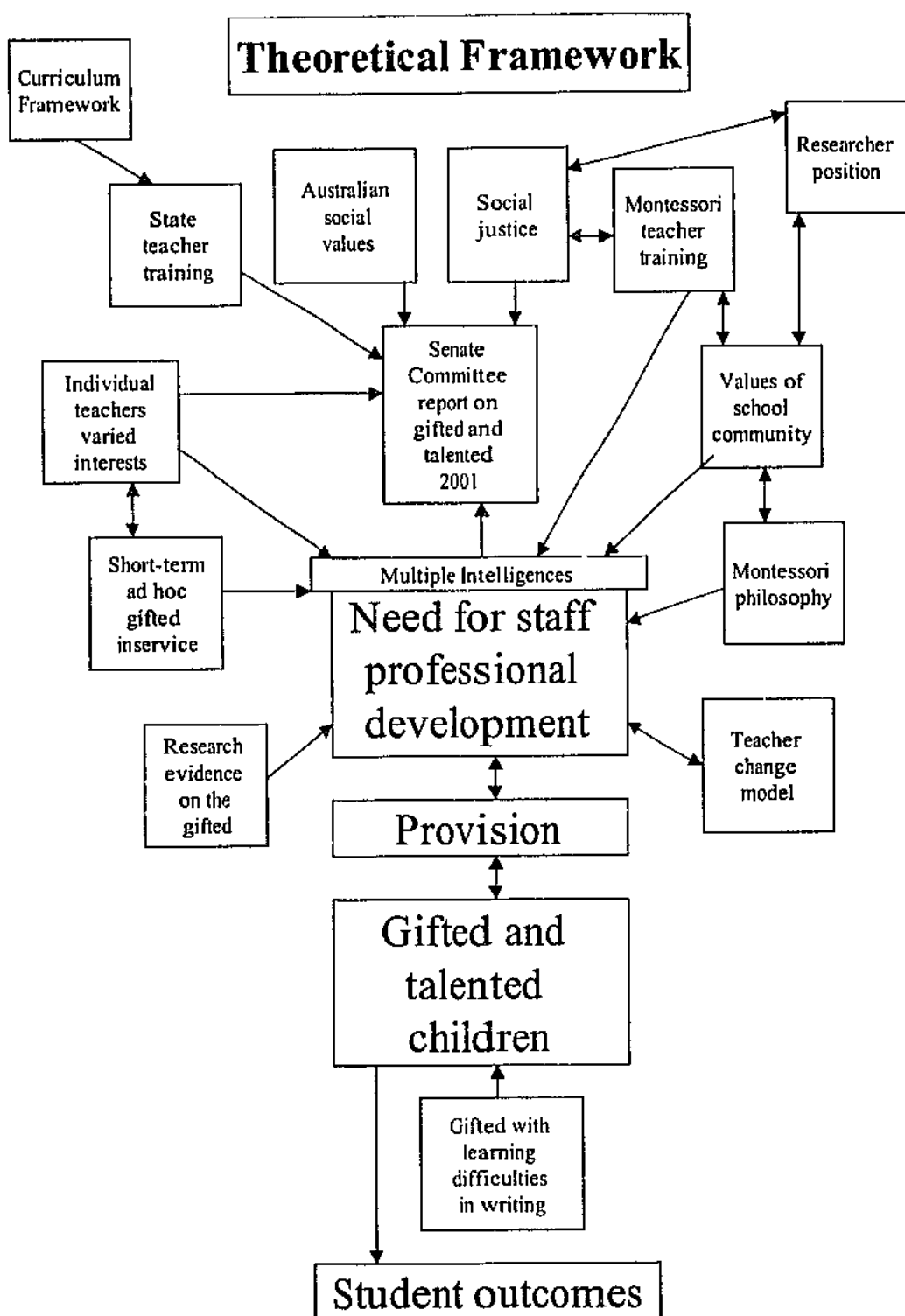


Figure 1-1. Issues influencing provision and student outcomes in this Montessori context.

Montessori Teacher Training

Although there appears to be an overlap between Montessori educational philosophy and provision for the gifted, specific instruction in gifted education theories, methods and strategies did not appear to be part of Montessori teacher training (J. Spencer, Montessori World Educational Institute, personal communication, June 28, 2003).

State Teacher Training

Anecdotal evidence suggested minimal or no training in gifted education was included as part of the Montessori teachers' State education courses (Parliament of the Commonwealth of Australia, 2001).

Individual Teachers Varied Priorities and Interests

Teachers at the school had input into the professional development courses they undertook. Apart from some whole-school professional development days, teachers could choose which other courses they attended. Teachers selected courses from a very wide range of topics on offer to schools and training in gifted education had to compete with these other professional development priorities and interests.

The Curriculum Framework

As an independent school in Western Australia, the particular Montessori school under consideration is required to comply with State *Curriculum Framework* (Curriculum Council, 1998). Anecdotal evidence suggested that this was seen by some of the teachers as a significant additional work pressure that had negatively impacted on the implementation of the Montessori curriculum.

Short-term Ad hoc Gifted Inservice

For those teachers who chose to attend prior gifted education professional development sessions, there had been no assessment of the usefulness or possible application of this training in the classroom context.

Australian Social Values

In broad terms, Australian social values are historically documented as being 'egalitarian' and 'non-elitist', except in the sporting arena (Parliament of the Commonwealth of Australia, 2001; Wilson, 1996). Such values work against positive attitudes toward the gifted and appropriate provision for their education.

Values of the Particular School Community Towards the Gifted

In terms of overall influence, the values of the school community towards the gifted appeared to co-incide with the wider Australian social values mentioned above. Evidence for this was obtained early in the study (see section on the reflective journal in Chapter 4).

Social Justice

The paramount reason behind this research being undertaken was the commitment of the researcher to 'social justice' for the gifted. 'Social justice' in this context meant identifying the gifted, understanding their individual needs, and providing appropriately for them in the classroom. This vision was shared, to varying degrees, by the staff at the school. The last Senate Committee report on the gifted in Australia, also argues strongly for provision for the gifted on 'social justice' grounds (Parliament of the Commonwealth of Australia, 2001).

Research Evidence on the Gifted

The forthcoming literature review in Chapter 2 provides research evidence that classroom provision for the gifted is often neglected, and furthermore, that twice-exceptional students are an under-served sub-group of the gifted (Fox et al., 1983a; Kyung-won, 1990; Silverman, 2003b; Starnes et al., 1988; Warshaw, 2003a; Whitmore, 1988).

Teacher Change Model

The process to support teacher change was an important factor in this study. An existing teacher change model was examined and adapted for application in the school under consideration. See also Chapter 2.

Researcher Position

As the teacher in the school with duties to support gifted students and children experiencing learning difficulties, this research enabled me to extend my personal knowledge about the gifted and seek to facilitate informed change in my workplace for the betterment of the gifted. In particular, my agenda was to enhance my own practice, contribute to a written school policy that addressed the needs of the gifted, and provide information and support to other staff to improve attitudes toward, the identification of, and classroom provision for, the gifted. See also the section on values and ethics in action research in Chapter 3.

1.6 Limitations of the Study

There are a number of limitations to this study. Although the research examined teachers' attitudes toward the gifted and classroom provision for these children, the results of the study cannot be generalised beyond the target population studied. Different Montessori schools and other schools with MAG classes do not have the same administrative, policy and procedural systems as the school under investigation. The research does not, therefore, attempt to extrapolate from the Montessori school under consideration to any other Montessori or MAG school, but some parallels may be found. There are methodological exclusions to this study as well. For instance, it was beyond the bounds of this study to interview gifted children and their parents.

Despite the foregoing limitations, this research provides new and original knowledge in areas that have been neglected, as outlined in the earlier section of this chapter on the significance of the study.

1.7 Definition of Terms

Terms used throughout this study are defined as follows:

Abilities and Talents by Domain - refers to the theory developed by Gagné involving different types of giftedness. This includes abilities and talents in the spheres of academic, and/or artistic, social, psycho-motor and other domains (Gagné, 1985, 1997).

Acceleration - refers to any strategy that enables students to progress more quickly than their age peers. It includes grade and subject acceleration, as well as early entry (Education Department of Western Australia, 1995, 2004b; New South Wales Department of Education and Training, 1991, p. 23).

Attitude - refers to an opinion, thought or feeling, about something or someone; it is an internal mental state that lasts for at least a short time and involves some level of assessment, favourable or unfavourable, toward that thing or person (J. Cooper & Stone, 2000; Eagly & Chaiken, 1993; Hogg & Terry, 2000; Trafimow, 2000).

Audit trail - refers to an approach in qualitative research to enhance the validity or 'trustworthiness' of the findings. It involves outlining a range of well-established research techniques, such as document searches, interviews and observation, which are fully documented in terms of who, when, where and how these techniques are applied. This clearly documented list of the research processes provides evidence to show that the explanations and conclusions of the study are credible (Janesick, 2000, p. 393; Olesen, 2000, p. 230).

Concept map - is an approach to planning and organising information that is represented in diagrammatic form. The term 'concept' means idea and the 'map' documents information on a topic. Concept maps are used to visually organise data in categories, show relationships in the data, identify relevant issues or themes, and enable a wholistic view of the concept being explored (Lewis, 2000; Ryan & Bernard, 2000; Schuster, 2002; Stake, 1995). See Chapter 4 for an example of a concept map.

Curriculum differentiation - refers to the modification of teaching environments and practices to develop appropriate learning experiences for different children (Education Department of Western Australia, 1995; Farmer, 1996; Framingham Public School's Services for Gifted and Talented K-12, 2002; VanTassel-Baska, 2002a).

Enrichment - refers to activities that increase the range of experiences for all students, such as, participation in competitions, clubs and excursions, as well as exposure to different levels of questioning, cooperative learning and thinking skills (Education Department of Western Australia, 1995; Wilson, 1996).

Giftedness - the definition used in this study was based on the work of Gagné (1985, p. 103): "Giftedness designates the possession and use of untrained and spontaneously expressed natural abilities in at least one ability domain, to a degree that places a student at least among the top 15% of his or her age peers".

Independent work cycle - In a Montessori school, during the school morning, students are mostly required to work independently on individual work programs, previously prepared by their teachers (Montessori, 1965; The International Montessori Index, 2004). Thus students have the opportunity to work in depth, and for prolonged periods on one lesson; they are not strictly confined to particular time slots for particular subjects. Throughout the morning period, or week, or term, depending on the depth of investigation required, students need to complete certain tasks, but in their own order and timing.

Individual Education Plan - refers to a collaboratively developed systematic plan that identifies a student's educational priorities, goals, and how these will be monitored and achieved (Education Department of Western Australia, 1996).

Learning difficulties - refers in this study to: "those students, excluding students with defined disabilities, who have significant literacy and[/or] numeracy problems with a history of learning difficulty" (Louden et al., 2000b, p. 129). Gifted children experiencing learning difficulties may not perform to expectations, even though they have high abilities in some areas. The cause of these difficulties are intrinsic, resulting from one or more basic information processing difficulties (Kyung-won, 1990; Louden et al., 2000b; Starnes et al., 1988).

Locus of control - refers to the degree to which students sense that they have control over their behaviour as learners. Locus of control is normally influenced by both internal and external sources. Students who demonstrate an internal locus of control feel responsible for their own learning behaviours, such as, choice of activity and pace of working. In contrast, students who demonstrate a predominantly external locus of control feel external factors, like teacher direction and supervision, reinforces their actions and behaviours (A. Y. Baldwin, 1985, p. 231; Bertram, 1998, p. 8; Janos & Robinson, 1985, p. 165; Seaward, 2002, p. 123).

Member checks - refers to an approach in qualitative research to enhance the validity of the findings. It involves the cross-checking of research work with the research participants by allowing the latter to review the collected data and written material (Janesick, 2000, p. 393; Olesen, 2000, p. 230).

Multi-Age Group (MAG) classes - refers to classes of children of mixed chronological ages. The Montessori "Children's House" class includes children from three to six years of age, the junior primary class caters for children from Years 1 - 4, while the senior primary MAG class includes students in Years 5 - 7 (The International Montessori Index, 2004).

Multiple Intelligences - refers to Gardner's (1983; 1993; 1998) theory that proposes nine areas of intelligence, not just one single general intelligence, and these nine intelligences are: logical-mathematical, verbal-linguistic, musical-rhythmic, visual-spatial, bodily-kinesthetic, intrapersonal, interpersonal, naturalist and spiritualist. This theory provides a framework for classroom teachers to identify giftedness and differentiate the curriculum (Bellanca, Chapman, & Swartz, 1996; Gardner, 1983, 1993; McGrath & Noble, 1995; Torff, 1998; Viadero, 2003; Vialle & Perry, 1995).

Talent - the definition used in this study was based on the work of Gagné (1985, p. 103): "Talent designates the superior mastery of systematically developed abilities (or skills) and knowledge in at least one field of human activity to a degree that places a student within at least the upper 15% of age peers who are active in that field or fields".

Teacher - in the research context, that is Montessori MAG classrooms, this term refers to a person having attained State teaching qualifications and Montessori teaching certification. However, two of the "teachers" in the given school context

have achieved only one of these qualifications but are in the process of achieving the other certification.

Triangulation - involves collecting data from a variety of sources, settings, time frames, research methods and theoretical perspectives, which are independent of one another (Cherry, 1999, p. 62; Patton, 1990, p.464; Stake, 2000b, p. 443; J. Webb, 2000, p.19).

Twice-exceptional - refers to children who are gifted and have learning difficulties or some other special need/s (Montgomery, 2003; Neumann, 2003; Silverman, 2003b; Warshaw, 2003a; Winebrenner, 2003).

Underachiever - refers to gifted children who are not performing to expectations, given high abilities in many areas. The causes of underachievement may be environmental, for instance, inappropriate curriculum and disinterested parental attitude toward education (Davis & Rimm, 1998; Kyung-won, 1990).

1.8 Plan of the Study

This thesis is presented in five chapters. The first chapter, the introduction, outlines the gifted education and Montessori issues relevant to this study, and identifies three research questions to be investigated. The focus of this research was on teachers' attitudes toward the gifted and classroom provision, with particular reference to twice-exceptional students who were gifted and experienced learning difficulties in writing.

The second chapter presents a review of the literature related to this research. There are three main sections to the literature review: first, literature examining the Montessori context; second, literature on gifted education; and third, literature on the research methodology employed in this study.

Chapter three describes the methodology and indicates why action research was chosen. Also described in this chapter is the target population. The wide range of instruments employed in the study are outlined, including an attitude scale, interviews, document searches, field notes and standardised assessments. The

chapter concludes with a description of the procedure of the study and the type of analysis undertaken on the collected data.

The fourth chapter presents the results of the collected data and is divided into three sections. The first section deals with an analysis of the data derived from two administrations of an attitude scale investigating teachers' attitudes toward the gifted. The next section focuses on interview data relating to classroom provision for the gifted and modifications to gifted programs. The final section presents statistical data obtained from standardised assessments of student achievement, indicating outcomes. This section is also informed by field notes.

The final chapter of this study, discussion and conclusions, reflects on the results of the research. The first of the five sections of this chapter reviews the key findings. This is followed by a discussion in which these findings are compared with the findings of similar studies. The third section presents conclusions to the study, which are directly related to the three research questions outlined in the introduction. Conclusions are drawn on teachers' attitudes toward the gifted and whether these changed over time, classroom provision for the gifted and modifications to gifted programs, together with teacher outcomes and some of the academic and social-emotional outcomes experienced by the gifted students. The fourth section of this chapter considers further implications of the findings. The chapter concludes with a discussion of new areas for future research that will further address the needs of gifted students.

CHAPTER 2

REVIEW OF LITERATURE

2.1 Introduction

This chapter establishes the context of the research in a Montessori school, reviewing evidence for the overlap of the Montessori educational approach with provision for the gifted. Current definitions of giftedness, and criteria for the identification of gifted children are examined, with particular reference to studies of twice-exceptional children who are gifted and experience learning difficulties. The characteristics and needs of gifted children, along with social justice issues involved in provision for the gifted, are also discussed. Various theories of gifted education, as well as models and programs relating to provision for the gifted, are reviewed. Finally the issues surrounding the current research are placed in a theoretical and methodological framework.

2.2 Montessori Context

Brief History of the Montessori Approach to Education

Maria Montessori was an Italian doctor who strove to improve the quality of children's education at the turn of last century (Kramer, 1976). She undertook a scientific approach to observations of children's development and developed an educational philosophy of teaching and learning, termed the "Montessori Method" (Montessori, 1964, 1965; The International Montessori Index, 2004). The Montessori Method embraces the 'whole' child, the physical, social, emotional, intellectual and spiritual development of each unique child. It also recognises that young children have "absorbent minds" and that their "sensitive periods" for different aspects of learning need to be responded to by providing an appropriately ordered, stimulating learning environment (Homfray & Child, 1999, p. 32; Lillard, 1996, p.

26; Montessori, 1964, 1984). In addition, Montessori argued that a child's strengths need to be nurtured and encouraged and areas of weaknesses need to be addressed and supported (Montessori Teacher's Association, 2002).

Research in Montessori education is an ongoing endeavour. Two major areas of current research focus on what constitutes authentic Montessori (Boehnlein, 1980; Dobozy, 1999; Erskine, 1998; Massang, 1999) and children at risk (Pickering, 1998; Pickering & Alegria, 1999). There has been no documented research conducted on provision for the gifted, although many features of Montessori philosophy appear to overlap with provision for the gifted.

Values of Montessori Educational Philosophy

To determine the key values of Maria Montessori's philosophy and method of education, a range of texts have been consulted and the following represents a combination of values identified (Kramer, 1976; Montessori, 1965, 1966; D. O'Donnell, 1996; Orem, 1971; Orem & Foster, 1978):

- Fostering a love of learning.
- Encouraging initiative, independent work habits, persistence in completing tasks, creative self-expression, self-motivation and concentration.
- Helping each child to develop self-respect, respect for others, respect for their environment, self-discipline, sociability, orderliness and co-ordination.
- Providing freedom for children to grow and learn, with opportunities to follow their interests.

The Montessori Method provides a "prepared" learning environment, which nurtures the growth of these values in the children (Montessori, 1964, 1984; Orem, 1974).

Characteristics of the Montessori Educational Philosophy that Overlap with Provision for the Gifted

It has been argued by proponents of Montessori that this style of education overlaps with provision for the gifted (Loeffler, 2001; Montessori Society of Western Australia, 2002). The Montessori approach focuses on the needs of the whole child, with the student's social, emotional, physical and academic needs being addressed in

an integrated manner (Homfray & Child, 1999, p. 7; Lillard, 1996, p. 8; Montessori, 1964, 1984; Montessori Teacher's Association, 2002). Furthermore, Montessori staff are trained to observe each child's "sensitive periods", which refers to the times when the child has the greatest capacity for particular types of learning, such as learning to read or write (Gettman, 1987; Homfray & Child, 1999, p. 35; Lillard, 1996, p. 25; Montessori, 1966, p. 37). This observational information is then used by staff to "follow the child" and develop individual programs for each child (Loeffler, 2001, p. 23). Such focus on nurturing individual differences is a strategy for catering for the gifted (Baum, 1990; Kerr, 2003).

Another key feature of the Montessori Method is the importance of the child centred, "prepared" environment (Lillard, 1996, p. 77; Montessori, 1966, p. 99; Montessori Society of Western Australia, 2002; Wentworth, 1999). Students work independently at their own pace, with appropriate resources readily available (Lewis, 2000; Lillard, 1996, p. 70; Montessori, 1964, p. 95). At the school under consideration, this may involve accelerated grade placement and/or accelerated subject areas based on very high test scores and other data (Lewis, 2002). Associated with the notion of learning independently, students can make choices about their learning program/s (Lillard, 1996, p. 70; Montessori, 1966, p. 120). Students can investigate their own individual interests (Lillard, 1996, p. 70; Montessori, 1966, p. 145). As well, students are guided in the evaluation of their own work (Lewis, 2000; Lillard, 1996, p. 11). Students are also encouraged to be aware of, and follow their own different learning styles (Lillard, 1996, p. 70; Montessori, 1964, p. 95). Thus, according to the Montessori philosophy, children in this environment become progressively more independent and responsible for their own learning (Lillard, 1996, p. 98; Montessori, 1984). These features of Montessori classrooms are also the characteristics highlighted in successful classrooms for the gifted (House, 1987, p. 35; Johnsen & Ryser, 1996).

Other aspects of the Montessori approach overlap with provision for the gifted. Montessori students are exposed to and expected to employ critical thinking skills, and their metacognitive skills are progressively developed (Lewis, 2000). In some Montessori schools the enhancement of these skills is set in the context of whole school recognition and application of the Multiple Intelligences theory (Bellanca et al., 1996; Gardner, 1983; Lewis, 2000; McGrath & Noble, 1995; Torff,

1998). Another aspect of overlap relates to 'multiple literacies', such as functional, social, situated and multicultural literacies. Elements of all these are found within Montessori education (Knight, 2002; M. O'Donnell, 2003). Finally, supporters of the Montessori method argue that the multi-age (MAG) classrooms facilitate in-class mentoring, which can be a support to gifted children (Homfray & Child, 1999, p. 115; Lillard, 1996, p. 6). It therefore seems that the needs of gifted students are automatically catered for in the Montessori learning environment. However, as indicated earlier, this does not always appear to be the case.

2.3 Definitions and Conceptions of Giftedness and Learning Difficulties

Giftedness

Controversy over the definition of giftedness is a feature of this field of study. Difficulties have arisen because, for instance, definitions refer to aspects that are too difficult to identify or to measure (Piirto, 1994, p. 12). Then, the various different perspectives of giftedness that different theorists have taken add to the complexity of the situation (Braggett, 1992, p. 19; Davis & Rimm, 1994, p. 17; Gross, 1993, p. 32).

The Education Department of Western Australia (2004a) uses the following definitions based on the work of Gagné (1985, p. 103):

Giftedness designates the possession and use of untrained and spontaneously expressed natural abilities in at least one ability domain, to a degree that places a student at least among the top 15% of his or her age peers.

Talent designates the superior mastery of systematically developed abilities (or skills) and knowledge in at least one field of human activity to a degree that places a student within at least the upper 15% of age peers who are active in that field or fields.

Thus 'giftedness' refers to a child's outstanding ability, while 'talent' focuses on outstanding performance, so 'talent' arises from 'ability' as an outcome of the child's learning experiences.

These definitions link in with the conception of 'giftedness' in the recently published Senate Committee Report. In that report the term 'giftedness' refers, in brief, to "high intellectual or creative ability", with "high" related to same age peers (Parliament of the Commonwealth of Australia, 2001, Ch. 2).

The Gagné (1985) definitions of 'giftedness' and 'talent' were adopted in this study for three reasons. First, Gagné (1997; 1999) recognised different spheres of giftedness, not only the academic sphere, and that approach was compatible with the Montessori educational philosophy. Second, the Gagné (1991) attitude scale on opinions about the gifted was employed as part of the present study and it was important to use a definition that was compliant with this scale. Finally, it was helpful for comparative discussion to use the same definition of 'giftedness' as that adopted by the public education department in this state.

Learning Difficulties

As with giftedness, the field of learning difficulties is littered with different definitions in use (Elkins, 2002, p. 11; Louden et al., 2000a, p. 3; 2000b, p. 128). Throughout Australia the terms 'learning difficulties' and 'learning disabilities' are variously employed. The issue of definition is often problematic with different definitions frequently used in the literature that are different to the common understanding of those terms in general use. In general, however, Australian education systems use the term learning difficulties "to cover all students with high incidence educational problems", with the exception of Queensland, where the term learning disabilities is "reserved for those who have not responded to remedial education" (Elkins, 2002, p. 15).

Children experiencing difficulty in learning usually do so because of a combination of interacting educational and student factors (Education Department of Western Australia, 1996; Louden et al., 2000a, 2000b, 2000c). Educational factors include, for example, strategies and programs that are developmentally, culturally and experientially inappropriate, while student factors range from developmental history, gender, physical and/or intellectual disabilities, specific learning difficulties, through to emotional and behavioural problems. In Western Australia these children would fall under the umbrella term Students at Educational Risk (SAER).

In a project brief, the Australian Department of Education, Training and Youth Affairs defined learning disabilities as referring to "a heterogeneous group of students who have significant difficulties in the acquisition of literacy and numeracy" and who do not have assessed intellectual, sensory, physical, social/emotional or multiple impairments (Louden et al., 2000b, p. 128). Thus a learning disability is considered to be "intrinsic to the individual" and not the result of any previously identified disability (Louden et al., 2000b, p. 128). In Western Australia the term learning disability is not commonly used. Generally the term learning difficulties is used to refer to this group of children, that constitutes around 16-20% of the total student population (Louden et al., 2000a, p. 8). Elkins (2002, p. 13) reported that "Australian surveys have consistently found that from 10-16% of students are thought by teachers to have support needs in literacy beyond those that could be addressed by class teachers".

For the purposes of this research, the Loudon et al. consensus definition of learning difficulties is adopted. Children experiencing learning difficulties are "... those students, excluding students with defined disabilities, who have significant literacy and[/or] numeracy problems with a history of learning difficulty" (Louden et al., 2000b, p. 129). Furthermore, learning difficulties are thought to be intrinsic to the individual, but students with sensory or intellectual problems and children whose poor school performance has arisen from inadequate teaching, social, cultural or environmental conditions are excluded (Kyung-won, 1990; Loudon et al., 2000b; Starnes et al., 1988). Thus a rough distinction can be seen between learning difficulties and difficulties arising from a physical disability, although this difference is not clear.

Dyslexia, a specific learning difficulty, has been linked to neurological conditions (Ellis, 1993; Everatt, 1999; Henderson & Miles, 2001; Lavoie, 1996; Pumfrey & Reason, 1998; Wallach & Butler, 1994). However, recent research with dyslexics, using functional magnetic resonance imaging technology, suggests that these children may not have a permanent brain abnormality (Aylward, 2004). After specific types of training, these children's brains can look the same as those of children without reading difficulties. This finding supports the view that learning difficulties are intrinsic to the individual, but not a permanent neurological abnormality. Similarly, learning difficulties in literacy related to writing in

particular, called perceptual motor dysfunction, have been linked with neurological problems, but a specific training regime has been shown to be effective in treating this condition (Laszlo, 1990; Laszlo & Sainsbury, 1994). Nevertheless, in Australia the emphasis has been on identifying and supporting children with difficulties rather than defining the problem (Louden et al., 2000b, p. 129).

In the present study the term 'learning difficulties' is used, except where the authors of other research used 'learning disabilities', then that terminology will be used when referring to their research. Finally, in the current study, gifted children experiencing learning difficulties in literacy, specifically writing, will be investigated because these students were of particular concern to their teachers.

2.4 Identification of the Gifted with Particular Reference to Twice-Exceptional Children

Identification of Gifted Children

Many authors have researched the issues involved in the identification of gifted children (Chan, 2000; Chessman, 2003; Damiani, 1997; Davis & Rimm, 1994; Gross, 1993, 1999; Harrison, 1994). Some researchers have focussed on the identification of gifted underachievers and gifted children from different cultural and socio-economic backgrounds, arguing that these children need to be included, not only the high achievers (Chaffey, Bailey, & Vine, 2003; Harslett, 1992, 1996; Kranz, 1994; Supplee, 1990). There is consensus among many researchers for identification to draw on information from a variety of sources, including standardised and informal assessments by teachers, behavioural indicators, parent information, peer report, student self-report, intelligence tests, creativity tests and multiple intelligence assessments (Chan, 2000; Chessman, 2003; Neumann, 2004b; Silverman, 2004). Guidelines for schools, for the identification of the gifted, reflect this recommendation to use a wide range of data sources (B. Clark, 1997; Education Department of Western Australia, 1995, 1997a; Gifted and Talented Children's Association of Western Australia Inc., 2003b; Harrison, 1999; Harslett, 1996; Langrehr, 2003; Vialle & Perry, 1995).

Designing a flexible and continuous identification process is essential, because gifts and talents may emerge at any stage of the educational process (Davis & Rimm, 1994; Piirto, 1994). It is deemed necessary to use the aforementioned varied inputs, in order to assist teachers to identify a student's intellectual strengths and weaknesses, talents, social and emotional needs. In the Montessori context this then facilitates the development of the child's own learning program, which may also include an Individual Education Plan (IEP).

Despite the availability of information on the identification of gifted and talented students, a recent Australian study reported low identification rates of these children (Bartak & Fry, 2004). Sixty primary and secondary teachers from randomly selected schools in the Eastern Region of Victoria provided data on 1505 students in their classes. The teachers described 12.02% of these 1505 students as students with special needs; with 10.03% identified as having learning difficulties and 1.26% identified as gifted and talented. The teachers tended to identify only extremely gifted students as warranting extension in their classroom programs. The figure of 1.26% indicated significant under-identification of gifted and talented students. Literature in this field has suggested that an appropriate figure should be around 15% of students being identified and catered for as gifted and talented (Bartak & Fry, 2004; Braggett, 1992). The study recommended that teacher training for the identification of gifted students needed to be substantially improved (Bartak & Fry, 2004, p. 16).

Another vital issue researchers have raised concerning the identification of gifted children is the recognition of different levels of giftedness (Chessman, 2003; Gross, 1993). This recognition is important because the level of a child's giftedness impacts on the nature of the individual program provided. In recent years guidelines for schools have increasingly drawn attention to the need to identify levels of giftedness (Association of Independent Schools of Western Australia, 2003b; Gifted and Talented Children's Association of Western Australia Inc., 2003b; The Gifted Education Research Resource and Information Centre, 2002, 2003). However, research indicates that Australian teachers need further training in the identification of different levels of giftedness (Bartak & Fry, 2004; Gross, 1993, 1999, 2002b).

Identification of Twice-Exceptional Children: Gifted with Learning Difficulties

Researchers have estimated the co-incidence of the exceptionalities of giftedness and learning difficulty (Ivicevic, 2004; Munro, 2002b). However, these estimates are somewhat confusing because different reference populations are employed, as well as the definition of terms used, learning 'disability' and learning 'difficulty'. For instance, Ivicevic (2004), who is currently conducting research at a Perth high school on students who have dual exceptionalities, estimated the twice-exceptionality of giftedness and 'learning disability' to be between two and ten percent of the general population. Alternatively, Munro (2004, p. 20), researching the reading characteristics of primary aged students in Melbourne stated that "up to thirty percent of gifted students display a learning disability, with ten percent reading at two or more years below their grade level". Thus further clarification of these estimates of dual exceptionality is required.

Identifying gifted children with learning difficulties has been recognised as problematic (E. E. Cooper, Ness, & Smith, 2004; Starnes et al., 1988). Research has been conducted using intelligence tests in an attempt to identify the unique characteristics of gifted children with learning disabilities, but no clear pattern has been found (VanTassel-Baska, 1992, p. 267). Although, when a difference of at least 15 points between Verbal and Performance scores on the WISC-R intelligence test occurs, and either the Verbal or Performance score falls in the superior range, then Fox and Brody (1983) suggest that a diagnosis of giftedness with learning disabilities could be considered. While some researchers have made recommendations on the definition and education of gifted students with learning difficulties (Beckley, 1998; Maker & Udall, 1985; VanTassel-Baska, 2002b), the problem remains that unless we are able to accurately identify such children, the recommendations cannot be implemented by teachers. As Stewart (2002, p. 4) argues, "Unfortunately, there is still confusion over the identification of gifted and learning disabled students ... [and] no generally accepted definition of gifted and learning disabled has been formulated".

Despite these definitional issues, researchers agree that a range of criteria to aid the identification of gifted students experiencing learning difficulties need to be employed, so that such students are not excluded from gifted programs (E. E. Cooper et al., 2004; Ivicevic, 2004). These criteria include a nomination process (teacher,

parent, peer, self), educational evaluation (both informal and formal), full-scale psychoeducational evaluation (Brody & Mills, 1997; Chaffey et al., 2003; Kokot, 2003b; Kyung-won, 1990; Montgomery, 2003; Senf, 1983; Tannenbaum & Baldwin, 1983) and referral to specialists when indicated. Some of the approaches to educational evaluation include the use of alternate forms of tests, nonverbal tests, the modified administration of tests, product portfolios and probationary status in a gifted program (Chaffey et al., 2003; Davis & Rimm, 1998, p. 346; VanTassel-Baska, Feng, & Quek, 2004). A few researchers have recommended that referral to specialists, like occupational therapists, speech therapists and behavioural optometrists, could be valuable when teacher tests of motor skills, language and vision issues (such as keeping place while reading and problems copying from the board) indicate there may be other contributing factors to difficulties experienced by the child (E. E. Cooper et al., 2004; Kokot, 2003a, 2003b). Furthermore, some authors advocate that the circumstances and needs of the whole child be considered so that their situation is addressed justly, that is, so that their giftedness is catered for in their individual program and undue focus is not placed on their learning difficulty or behavioural problem (Baum, 1990; Roeper, 1996; Winebrenner, 2003).

Identification of Gifted Underachievers

Gifted students have special learning needs and if these are not met, students may become bored and frustrated, losing self-esteem and the 'spirit' to excel (Lawver & Kottmeyer, 2004c; McCoach & Siegle, 2003). Some researchers make a distinction between the gifted students with learning difficulties and gifted underachievers (Davis & Rimm, 1998; Kyung-won, 1990), while others argue that there can be an overlap of these two sub-groups of the gifted (Munro, 2002c; Starnes et al., 1988; Supplee, 1990, p. 5). This issue is further confounded by varying uses of the terms learning 'difficulty', 'disability' and 'problems', employed by the different researchers. Kyung-won (1990, p. 14) argues that "the etiology of learning difficulty and underachievement among the gifted are different" and that it is important to separate these two categories for the purpose of differential treatment, because the students' needs are different. In a study conducted by Starnes, Ginevan, Stokes and Barton (1988, p. 4) forty one gifted 'underachievers' "needed intervention because of learning problems" and "twenty four students were identified as gifted and talented

who had not previously been so identified; many of these were already coded as learning disabled". Although there appears to be an ongoing confusion of terms in the literature, gifted underachievers were distinguished from gifted students with learning difficulties in the present study. While both types of children may not perform to expectations, gifted underachievers seem to do so because of environmental causes, whereas for gifted students with learning difficulties the causes appear to be of intrinsic origin.

Gifted underachievers can be identified by high academic ability with low academic achievement, superior comprehension and retention of concepts when interested, inappropriate risk-taking behaviour, poor work study and time management skills and not making a good effort, with daily work being frequently incomplete or poorly done (Kyung-won, 1990; Robson, 2003; Silva, 2003; Starnes et al., 1988; Supplee, 1990). Also, these students typically lack an internal locus of control, having difficulty accepting responsibility for their own learning (Davis & Rimm, 1998). Some authors question whether schools are teaching gifted children to underachieve, by employing a curriculum that is too easy for them, or over-emphasising co-operative learning (Davis & Rimm, 1998, p. 301; Schultz, 2002, p. 193). Some exposure to competition is seen as useful so that the students are prepared for subsequent educational settings and the work place (Schultz, 2002).

Student withdrawal at school, socially, emotionally or physically from the school environment, is another indicator of the gifted underachiever (Davis & Rimm, 1998). Establishing and utilising support networks within the school and community, and knowing and engaging the students' strengths and passions, are strategies to assist the withdrawn student (Robson, 2003; Silva, 2003; VanTassel-Baska, 1990). Low self-esteem and poor social skills, are additional features commonly observed in gifted underachievers (Davis & Rimm, 1998; Kyung-won, 1990; Schultz, 2002). Guidelines for teachers, developed from the foregoing research, are available to assist teachers identify and support gifted underachievers (Davis & Rimm, 1994, 1998; Department of Education Queensland and the Queensland Association for Gifted and Talented Children Inc, 1988; Gifted and Talented Children's Association of Western Australia Inc., 2003a; Lawver & Kottmeyer, 2004c).

2.5 Characteristics and Needs of the Gifted with Particular Reference to Twice-Exceptional Children

Characteristics of Giftedness

Gifted children may display certain characteristics that are indicators of their giftedness. One key characteristic of giftedness is the ability to learn easily and rapidly (BBC Worldwide Ltd, 1998; Education Department of Western Australia, 1995, 1997a; Gagné, 1999; White & Gribbin, 1992). Many comprehensive lists of characteristics of giftedness in children have been compiled and the following is a precis of the categories identified:

- Cognitive - for example, high level of language development, flexible and accelerated thought processes;
- Affective - such as, keen sense of humour and perfectionism;
- Physical - including heightened sensory awareness, as well as discrepancy between physical and intellectual development;
- Intuitive - for instance, creative in many areas of endeavour and may experiment with metaphysical phenomena;
- Social - as in leadership, involvement in social and environmental problems (Davis & Rimm, 1998, p. 26; VanTassel-Baska, 1992, p. 49; 1994, p. 54).
- Lists of characteristics of giftedness are often presented as guides to traits that may occur, in order to assist educators identify such children and provide appropriate programs (Betts & Neihart, 1988; B. Clark, 1997; Damiani, 1997; Harrison, 1994, 1999; House, 1987; Kerr, 2002; Layton, 2001).

Characteristics of the Gifted with Learning Difficulties

Some of the world's famous achievers, such as Leonardo da Vinci, Winston Churchill, Thomas Edison and Albert Einstein, were gifted people who also had learning difficulties (Fox et al., 1983a; Kyung-won, 1990; Little, 2001). All these gifted adults experienced poor school achievement in some learning area/s.

During the 1970s, in the United States of America, research on gifted students with learning 'disabilities' began to gain wider interest (Fox et al., 1983a; Whitmore, 1980). Over the last two decades there has been increasing attention given to children experiencing these two exceptionalities (Brody & Mills, 1997; Feldhusen, VanTassel-Baska, & Seeley, 1989; Kokot, 2003b; Kyung-won, 1990; Little, 2001; Montgomery, 2003; Ray, 1997; Silverman, 2003b; Starnes et al., 1988; Warshaw, 2003a). Most of the foregoing research on the gifted with learning difficulties was conducted in North America. It has only been during the last few years that there has been growing research interest in Australia, with these twice-exceptional students (Ivicevic, 2004; Munro, 2002b, 2002c).

Despite confusion with the definition and use of terms relating to the gifted with learning difficulties, there appears to be some agreement amongst researchers regarding some of the characteristics of these students. For example, researchers have found that twice-exceptional children may be characterised by performing a task in a new or creative way but seeming not to follow directions, by the need to avoid failure leading to refusal to perform certain tasks, and by being capable of self-entertainment for long periods of time when there is no required work to do (Kyung-won, 1990, p. 9; Maker & Udall, 1985; Mann, 2002; A. Martin, 2003b; Montgomery, 2003). Guidelines to assist teachers recognise twice-exceptional students have been developed from this research evidence (Eide, 2003; Gallagher, 2002; Gifted and Talented Children's Association of Western Australia Inc., 2003a; Lawver & Kottmeyer, 2004b; A. Martin, 2003a; Silverman, 2003a, 2003b; Warshaw, 2003a, 2003b; Willard-Holt, 1999).

From a Multiple Intelligences perspective it can be seen that a gifted child may also have a learning difficulty (Cline & Schwartz, 1999). For example, a child may have exceptional ability in verbal/linguistic intelligence, while have a learning difficulty in the logical/mathematical area. It is also possible for a child to manifest a gift and learning difficulty within the same 'intelligence', such as, within the verbal/linguistic area, displaying brilliant oral language skills while having a learning difficulty in reading or written language (Fox et al., 1983a; Liddle & Porath, 2002; Silverman, 2003a; Stewart, 2002). Within the bounds of this study, only gifted children with learning difficulties in literacy will be considered.

Social Justice and the Use of Limited Resources for Gifted Education

Appropriate educational provision for gifted children is a social justice issue (Parliament of the Commonwealth of Australia, 1988, 2001). The recent Senate Report outlines the case for providing for gifted children, arguing that 'special needs' includes the gifted and that it is necessary to respond humanely to the special needs of this group of children (Parliament of the Commonwealth of Australia, 2001, Ch. 2, 2.90). Gifted children warrant special intervention because, "...for many their needs are not being met; and many suffer underachievement, boredom, frustration and psychological distress as a result" (Parliament of the Commonwealth of Australia, 2001, p. 2.88). Likewise, other researchers have indicated the need for social justice for twice-exceptional children, that is, this hidden sub-group of gifted children with learning difficulties. For instance Munro (2002a, p. 2), an Australian researcher who has investigated aspects of diagnosis and provision for these children, states:

The effects of misdiagnosis and inappropriate teaching for these students can be severe, at the personal level leading ultimately to alienation from the education system, at the cultural level a loss of innovation and creativity capital, knowledge resources that we can ill afford to lose.

Many other authors similarly maintain that it is only fair and just that the special needs of all gifted children be recognised and met, even though there are limited resources (Capp, 2001, 2002; Eby & Smutny, 1990, p. 5; Gross, 1999, 2002a; House, 1987, p. 3; Jones, 1992; Little, 2001, p. 9; Maker, 1986, p. 232; 1993, p. 6; Vaughn, Bos, & Schumm, 2000; Wilson, 1996; Winebrenner, 2000). Thus, as a social justice issue, it is vital for educators to address the needs of the gifted. This is the position the researcher takes in the current study.

2.6 Gifted Children at a Montessori School

The Broader Australian Context

The Montessori system of education has a long history of supporting children with learning difficulties and other disabilities (Grier, 2001; Lord, 2001; Marshall, 2001; Montessori, 1964; Morris-Coole, 2001; Orem & Foster, 1978; Pickering, 1998;

Pickering & Alegria, 1999). Furthermore, it has been argued that the features of Montessori education overlap substantially with features appropriate for provision for the gifted. Thus, the very nature of Montessori education appears to address many issues for gifted learners. However, anecdotal observation of gifted students revealed that being in a Montessori setting did not necessarily fulfill expectations that their needs were catered for. This appears to be the usual situation in many schools (Archambault et al., 1993; Association of Independent Schools of Western Australia, 2003a; Bartak & Fry, 2004; Taylor, 2001; Whitton, 1997; Wibowanto, 2003). A range of problems, relevant in the broader Australian context, contributes to gifted Montessori students not having their requirements met.

The lack of appropriate teacher training is one reason that gifted students in Australia are not well catered for (Gross, 1993, pp. 56, 270; 2002a; Parliament of the Commonwealth of Australia, 1988, 2001). There are considerable teacher expertise requirements for staff working with the gifted, involving the necessity for inservice training and/or postgraduate courses (Parliament of the Commonwealth of Australia, 1988, 2001). For example, school staff are expected to counsel gifted children, and their parents, on a wide range of issues, from academic to socio-emotional matters related to giftedness, however their training to do so is frequently insufficient. Furthermore, in the school under study, teachers are involved in planning individual programs for the gifted. For such planning to be effective, training in planning for gifted education is required. Unfortunately, in Australia, inadequate teacher training in the field of gifted education is frequently the case (Braggett, 1985; Department of Education Queensland and the Queensland Association for Gifted and Talented Children Inc, 1988; Gross, 2002a; Gross, MacLeod, Drummond, & Merrick, 2001).

Another problem contributing to inadequate catering for the gifted in Australia appears to occur because of a lack of understanding of giftedness and generally negative or indifferent social attitudes towards the gifted (Braggett, 1985; Gross, 1993, p. 56; 2002a; Parliament of the Commonwealth of Australia, 1988, 2001; Wilson, 1996, p. 81). The Australian ethos of an easy-going 'work ethic' and the high value of sport compared to academics and creativity, add to this problem (Malan, 2004; Wilson, 1996). There are also many myths surrounding the notion of giftedness. These myths have contributed to poor servicing for the gifted. Such myths include, for example, 'gifted children learn anyway' and 'all children are gifted'

(Braggett, 1992, p. 3; Gross, 1993, p. 43; 1999; Hewton, 2004, p. 2). The recent Senate Report presents research evidence that refutes these popular beliefs. Gifted children will not succeed without support (Parliament of the Commonwealth of Australia, 2001, Ch. 2). Another myth, prevalent at the school in the present study, equates being gifted with having a 'strength'. Research evidence shows there is a clear difference between giftedness and having a 'strength' (Gross, 1999, 2002a; Parliament of the Commonwealth of Australia, 2001, Ch. 2, 2.87).

The poor catering for the gifted may also be related to the setting of low literacy and numeracy "benchmarks" in Australia. Emphasis on "benchmarks" discourages high achievement and minimises a focus on excellence (Parliament of the Commonwealth of Australia, 2001, Ch. 2). A final issue contributing to the underservicing of the gifted in this country seems to be linked to teachers' heavy workloads and their differing priorities about who are the children in most need of additional services (Braggett, 1985; Connell, 1985, p. 53; Louden, 1987).

Research and Gifted Students in a Montessori School

Although there is some literature on gifted children in Montessori schools, there is no documented research found on Montessori teachers' attitudes toward the gifted, or the identification of, and classroom provision for, these students. There has been, however, some research conducted on Montessori methods applied to children experiencing learning difficulties (Pickering, 1998; Pickering & Alegria, 1999). Nevertheless, the notion of gifted students with learning difficulties was not considered in that research.

At the Montessori school in the present study, anecdotal evidence suggested that children who were experiencing learning difficulties were provided with support in a variety of forms, tailored to their unique needs. However, in contrast to these students, limited curriculum differentiation appeared to have been undertaken for the gifted students in the school. This personal observation was in agreement with research that suggested, regardless of school system, that teachers made only minor modifications to the curriculum in an attempt to meet the needs of the gifted (Archambault et al., 1993; Taylor, 2001; Whitton, 1997). Furthermore, formal testing for the identification of gifted children only occurred in the school when

teachers or parents requested it on a case-by-case basis; thus the total number of gifted children at the school was unknown.

Prior to the research commencing at this Montessori school, teachers indicated that they endorsed multiple intelligence theory and accessed information from a range of authors who advocated this approach to gifted education (Gardner, 1983, 1993; Lewis, 2000, 2002; McGrath & Noble, 1995; Vialle & Perry, 1995). The teachers stated that they developed programs that encouraged their students to reach their potential in all domains of the multiple intelligences. However, at this school there was a commonly expressed belief that all children were 'gifted' in some intelligence. Anecdotal evidence suggested that this belief appeared to be related to the 'whole child' philosophical outlook, where every child was deemed to have a 'strength' in some area. This belief, which coincides with one of the aforementioned myths about giftedness, confused the meaning of being 'gifted'.

Another issue at the school in the current research concerned the need for a whole school approach to the education of the gifted. In an analysis of gifted education in Australia, Braggett (1992, p. 29) argued that it was essential for provision for the gifted to be a total school approach, to ensure ongoing program success. At the whole school level, at this particular Montessori school, there was majority agreement regarding the need for a whole school approach.

Difficulties in catering for gifted children seemed to arise from within the Montessori setting as well as the broader Australian context. Apart from limited curriculum differentiation, other aspects that seem to be relevant in the present study included, for instance, the application of narrow identification criteria and students' limited contact with gifted peers. The latter is frequently a problem, particularly for upper primary students in Australian Montessori schools. This is because these schools are small, usually ranging from 100-200 children in total, with fewer senior primary students compared to those in the Children's Houses and junior primary classes (The International Montessori Index, 2004).

Labelling children is another issue relevant to provision for the gifted at the Montessori school in the present study. Whilst it is vital to identify gifted children so that appropriate classroom provision can be made for them, some researchers recommend that the children are not publicly labelled as 'gifted' or as having a 'learning difficulty' (Frean, 2001; Roeper, 1996; Sedgwick, 2001). This approach,

such researchers argue, could prevent emotional problems arising from labelling, such as pressure on the child from others' high, or low, expectations. This attitude is also in keeping with the Montessori value of treating each child as a unique individual, and will be revisited later.

The Students At Educational Risk (SAER) policy of the Education Department of Western Australian includes gifted students, since it mentions "...those students who may be at risk of not achieving the major learning outcomes of schooling to levels which enable them to achieve their potential (Education Department of Western Australia, 1998). The Association of Independent Schools of Western Australia (2003a; 2003b) similarly supports an inclusive gifted education policy in schools. This notion of giftedness and learning difficulties being considered together in an at-risk or special needs policy, along with related recommendations by the Senate Committee Report on gifted education in Australia (Parliament of the Commonwealth of Australia, 2001), was reflected upon by the school staff involved in the present study. As part of the Montessori tradition to support students with special needs (Orem, 1971, p. 15; Pickering, 1998), the current research investigated gifted Montessori students with learning difficulties in literacy, in particular those with difficulties in writing.

Research on Teacher Change Through Professional Development on the Gifted

Problems have been identified with provision for the gifted in the Montessori school that participated in the current research. In common with teachers Australia wide, staff typically received no specific guidelines for the education of the gifted in their State or Montessori training (Parliament of the Commonwealth of Australia, 2001). Some staff members had attended short-term professional development sessions on aspects of provision for the gifted, such as critical thinking skills, but no coherent training program had been undertaken (Lewis, 2000; J. Spencer, Montessori World Educational Institute, personal communication, June 28, 2003).

Although there has been no research found on teacher change in Montessori settings, Australian research has been conducted on models of teacher change (Goodrum et al., 2001; Gross, 1994, 1997; Sheffield, 2002). Successful strategies to facilitate teacher change have been identified and are discussed in the methodology

section of this chapter (Goodrum et al., 2001; Hall & Hord, 1987; Richardson, 1994b).

Research on Gifted Students in Multi-Age Classes

An important issue arising from the Montessori context relates to the complexity of MAG classrooms (The International Montessori Index, 2004). Same grade mixed ability classrooms typically have a mental age spread of at least 5.8 years (Wilson, 1996, p. 24); therefore in a Montessori MAG junior primary class, consisting of children in Years 1-4, the mental age spread would clearly be greater than in a same grade class. Thus, even though Montessori class sizes are smaller than same grade classes in regular schools, it could be argued that considerable demands are made on Montessori teachers in terms of meeting individual student needs.

In a United States study investigating multi-age classes, Schaeffer and Hook (1996) conducted a survey of forty-nine rural school districts in a Rocky Mountain state. Twenty of these districts had schools with multi-age groupings, however the definition of MAG varied between schools, including for instance, Year 1/2 splits, Years 4-6 and a K-Year 3 grouping. Most teachers involved in these MAG classes chose to work in this setting and provided developmentally appropriate programs for their students (Schaeffer & Hook, 1996). Teachers in that study indicated that working in a MAG environment afforded numerous benefits, such as, flexibility in curriculum implementation and student challenge arising from individualisation of their work. Nevertheless, the teachers admitted that MAG settings required more teacher-time for program preparation and monitoring student progress (Schaeffer & Hook, 1996). That finding supports the view that MAG classes may place additional demands on Montessori MAG teachers, compared to teaching in regular, same-age settings.

Other overseas studies contribute to the growing body of literature that suggests that developmentally appropriate multi-age groupings are advantageous to gifted students. For example, in a study of elementary students attending public schools in Fayette County, Alabama, researchers randomly selected a group of 184 Pre-school and Year 1 students in regular, same-age, classroom settings and compared them to 159 students of same grade-level category assigned randomly to

nongraded, continuous progress settings (Tanner & Decotis, 1995). Comparisons were made on academic achievement and attitude toward school. Tanner and Decotis (1995, p. 142) found significant mean differences favouring the nongraded, continuous progress group for listening/speaking skills, writing skills, mathematical problem solving skills and fifteen measures of citizenship. Another researcher found that a gifted student in a MAG context could benefit from this environment, if the teacher provided a fluid multi-grade curriculum, with open-ended and flexible learning and teaching (Barone & Schneider, 2003).

A meta-analysis of research on high ability students in multi-age classrooms found "the research evidence is generally supportive or at least not negative" regarding the benefits for these students (Lloyd, 1997, p. 18). Whether or not multi-age classes were advantageous in meeting the needs of gifted students depended on a range of issues, including the teacher's willingness to provide appropriate, individualised curriculum differentiation (Lloyd, 1997). According to Lloyd (1999, p. 187) "Teachers of multi-age classes may be more likely to see their students as diverse than as similar and to provide developmentally appropriate (that is, differentiated) curricula".

An Australian study reported the results of an Academic Enrichment Initiative developed by five public schools in the south coastal region of New South Wales (Varley & Vialle, 1994, p. 11). The Initiative included both ability-grouped activities and mixed-ability (chronologically grouped) activities. Gifted children representing all grades in the five schools were involved in a range of enrichment programs, including writing, debating and special interest workshops. Both types of grouping were successful, with positive outcomes for the targeted students (Varley & Vialle, 1994, p. 16).

In brief, research has suggested that multi-age groupings can be beneficial for gifted students, particularly when classroom provision for them includes developmentally appropriate curriculum differentiation.

2.7 Teachers' Attitudes Toward the Gifted

Community and Teacher Attitudes

Teachers' beliefs and attitudes impact significantly on classroom practices (Plunkett, 2000; Richardson, 1994a). So, in the present study both attitudes and classroom provision are investigated. This research adds to a long history of studies conducted on community and teacher attitudes toward, and understandings of, gifted children.

In 1962 a study of adolescent attitudes concluded that gifted students who had little aptitude for sport were very unlikely to experience peer acceptance (Tannenbaum, 1962). A later study obtained results that indicated that teachers-in-training and experienced teachers valued athleticism over academic brilliance (Cramond & Martin, 1987).

Some other early studies indicated that teacher attitudes and expectations influenced gifted students' performances and self-perceptions (Bagsby, 1979; Pidgeon, 1971; Sutherland & Goldschmid, 1974). Mixed results have been reported on teachers' attitudes toward the gifted. A number of studies provided evidence that teachers tended to view gifted students positively and gave preferential treatment to them (Cavin, 1980; Riggott, 1980; Rubovits & Maehr, 1973). In contrast, other research showed that teacher attitudes toward the gifted were negative (Craven, 1980; Jacobs, 1972).

Examining the issue from a different point of view, some researchers argued that teachers' attitudes were related to the amount of teaching experience and grade level taught, and not to whether they had professional development on gifted education (Rubenzer & Twaite, 1979; Weiss, 1978). Another study discovered that experienced teachers' level of provision for the gifted surpassed that of novice teachers (Hamminen, 1988). A more recent study found that effective teachers of the gifted needed more grade specific preservice and inservice training, as well as involvement with gifted students (Copenhaver & McIntyre, 1992).

During the 1980s Gagné and Nadeau worked on developing a scale to examine attitudes toward giftedness. In a Canadian study involving 168 primary and

secondary school teachers and 165 parents of primary and secondary school children, six provisory dimensions of attitudes toward the gifted were identified (Gagné & Nadeau, 1983). The clarification of these dimensions was seen as the first step in the construction of a reliable and valid attitude scale toward giftedness. Respondents in the study were asked to indicate their agreement or disagreement to sixty items, using a 5-point Likert scale, with choices from completely agree to completely disagree. The scale in this research was subsequently refined and called "Opinions about the gifted and their education" (Gagné, 1991, p. 1). Six distinct attitude themes were identified (see below) and the 5-point Likert scale was modified, with choices from strongly agree to strongly disagree. See Appendix 1. The scale measures attitudes toward the gifted across six factors:

- Needs of gifted children and support for special services.
- Objections based on ideology and priorities.
- Social usefulness of gifted persons in society.
- Rejection of gifted persons by others in the immediate environment.
- Attitudes towards ability grouping.
- Attitudes towards acceleration.

A review of studies investigating community and teacher perceptions of the gifted was undertaken by Begin and Gagné (1994b). These researchers examined thirty-five studies and found nearly fifty different variables being potential explanatory factors for predictors of attitude toward gifted education. However, not one of them could account for a significant and substantial proportion of the variation in attitude among educators, parents, adolescents and the general public. This negative outcome arose from weaknesses in the methodological characteristics of these studies (Begin & Gagné, 1994a, 1994b). These authors found that the majority of studies did not meet at least two of the following criteria, thereby jeopardising the quality of the results (Begin & Gagné, 1994b, p. 174):

- Use a reliable and valid measure of attitude.
- Introduce a sufficient number of pertinent and adequately operationalised explanatory variables.

- Select a suitable sample from a relevant population.
- Use appropriate statistical methods to analyse the data.

Consequently, these authors made recommendations for researchers in this field, including, "Choose a psychometrically proven attitude scale instead of writing your own 'kitchen-table' questionnaire" (Begin & Gagné, 1994a, p.175).

Adopting the foregoing criteria, Begin and Gagné (1994a) investigated attitudes toward the gifted of a sample of 139 teachers and 138 parents of elementary and high school students. These respondents completed an attitude scale of sixty items and ten questions in a socio-demographic survey. It was found that 'socio-economic status' and 'contact with giftedness' explained twelve and ten percent respectively, of the variance in attitude scores (Begin & Gagné, 1994a). Thus, these authors argued, "If the results of the present study were so much more significant than those of past studies, it is probably because it did follow more closely than any previous one the four criteria proposed by Begin and Gagné ... in their literature review" (Begin & Gagné, 1994a, p. 83). Therefore, based on research evidence, the adoption of the recommended criteria appears to be merited in studies of teacher attitudes toward the gifted. Hence the Gagné & Nadeau attitude scale (Gagné, 1991) was used in the present study, as well as in some previous Australian research (S. M. Cooper, 1999; Gross, 1997) on attitudes of teachers toward the gifted.

Australian Research on Attitudes Toward the Gifted

In Australia, during the 1970s, there was an upsurge of interest in the education of the gifted because concerns were raised about this group being neglected (Braggett, 1985; Casey, 1981; Deschamp et al., 1981; Shean, 1983). Governments issued policy statements on the education of the gifted and talented, new programs were developed in an attempt to meet these students' needs and increased research on this group was undertaken (Braggett, 1985, pp. 297-314; Parliament of the Commonwealth of Australia, 1988). It was found that Australian attitudes toward the education of the gifted were more negative than those in most other industrialised countries (Fetterman, 1988; Goldberg, 1981). An Australian study of adolescent attitudes toward the academically brilliant, following on from Tannenbaum's (1962) work, found teenagers who were average, non-studious and

athletic were more favoured than those who were brilliant, studious and non-athletic (Carrington, 1993).

In research that investigated teachers' attitudes toward the gifted, it was found that most Australian teachers shared the wider community belief that gifted students would succeed with little assistance, and this was reflected in their classroom practice (Leder, 1987). Research by Gross (1994) found New South Wales teachers' attitudes toward gifted students and their education could be enhanced by an intensive professional development program.

A study of 166 primary teachers working in twenty three Catholic schools found that these teachers supported the need for special educational provision for the gifted, that they preferred enrichment and grouping strategies over acceleration, and that further teacher training on the personality and social characteristics of the gifted could improve their identification procedures (S. R. Smith & Chan, 1989). A subsequent study of 187 secondary teachers in New South Wales found strong support for special provisions for the gifted, but less agreement as to whether these students were adequately catered for (W. Smith & Chan, 1996). This study also found that teachers had a moderate understanding of the general characteristics of the gifted but "relatively poor understanding of the problems they faced" (W. Smith & Chan, 1996). Teachers at the schools in the study were found to favour enrichment over acceleration programs (W. Smith & Chan, 1996). It can be observed that acceleration is not widespread in Australia, even though there is considerable research support for this form of provision for the gifted (B. Clark, 1997; Gross, 1993; Gross et al., 2001; S. R. Smith & Chan, 1989; W. Smith & Chan, 1996).

Another Australian study, involving sixty two primary and secondary teachers from twenty four schools in Victoria, found positive teacher attitudes toward the gifted (Plunkett, 2000). Even so, this research suggested that the teachers "were prone to misconceptions and uncertainties in relation to the educational requirements of this group" (Plunkett, 2000, p. 41). Plunkett (2000, p. 42) recommended appropriate training to address this situation.

Since the attitude scale in the latter study was researcher-designed, as was the case for most of the Australian studies reported here, the detailed results of such studies were not readily comparable with each other, nor with the current research.

However, the broad findings of these studies provides information about Australian trends in this field, relevant to the present study.

Two recent Australian studies investigating teachers' attitudes toward the gifted employed the Gagné and Nadeau attitude scale (Gagné, 1991). The attitudes of teachers attending a one day in-service were compared with those who completed a post-graduate course on gifted education (Gross, 1997). Seventy-eight primary and secondary teachers in New South Wales attended a 6 hour in-service on gifted education, and completed the survey twice, at the beginning and the end of the in-service (Gross, 1997). Also participating in the study were seventy primary and secondary educators who attended a postgraduate course, the Certificate of Gifted Education at the University of New South Wales, which consisted of 75 hours of lectures (Gross, 1997). The survey was administered on the first and last day of the course. The research found that strong positive changes in teachers' attitudes to gifted and talented children could be effected through carefully planned and well conducted professional development programs, in both the short in-service and the intensive tertiary settings (Gross, 1997). This study did not include a breakdown of results by level of schooling taught, that is, there was no differentiation between teachers at the primary or secondary level (Gross, 1997, 2003).

The attitudes of West Australian university student teachers toward gifted and talented students were examined by Cooper (1999). Two cohorts of secondary student teachers were involved in the study, 108 in the 1996 cohort and 63 in the 1997 cohort. This research also employed the Gagné & Nadeau scale (Gagné, 1991), and found that student teachers in the 1996 cohort indicated an overall positive attitude toward the gifted, while the student teachers in the 1997 cohort initially expressed an overall ambivalent attitude toward the gifted, which changed adversely to a negative attitude after completing a university module on catering for high ability students in the regular classroom. According to Cooper (1999, p. 103) student teachers had preconceived ideas about the gifted and there was a need for "university modules that are more effective in changing university students' attitudes toward the gifted". However, the attitudes of seventeen teachers from the 1997 cohort were reassessed the following year after graduation and employment as teachers. It was found that these practicing teachers, who had previously participated in the tertiary module, later manifested improved attitudes toward the gifted (S. M. Cooper, 1999,

p. 83). This finding suggested that ongoing classroom experience, after prior training, had a positive influence on attitudes toward the gifted.

A recurring theme arising from the Australian research on teachers' attitudes toward the gifted relates to the need for intensive professional development in the field of gifted and talented education. Since research has shown that enhanced attitudes toward the gifted impacts positively on classroom provision for these students (Plunkett, 2000; Richardson, 1994b), such professional development is required not only at the pre-service level but also for practising teachers who may not have had any substantial training in this field (Gross, 1994, 1997). Thus the current research included a component of professional development. This research also employed the Gagné and Nadeau attitude scale (Gagné, 1991) to enable some detailed comparisons with the results of other recent Australian studies.

2.8 Theories of Gifted and Talented Education

Since Terman's work in the early 1920s on the unitary IQ score, there have been significant theoretical changes in the field of gifted education (Piirto, 1994). Thus there are now many theories relating to giftedness. All these theories can not be covered here. For a concise outline of developments in the field see Piirto (1994).

As the Montessori educational approach emphasises the 'whole' child, it would seem appropriate that theorists and theories that view giftedness in this 'whole child' perspective are particularly relevant in the Montessori context of this research. Three such theories will be discussed briefly, namely, Multiple Intelligence theory (Gardner, 1983), the 'Confluence of Three Areas' conception of giftedness (Renzulli, 2002; Renzulli & Reis, 1986) and 'Abilities and Talents by Domain' (Gagné, 1985, 1999).

Multiple Intelligence theory allows teachers to view all students positively, as unique individuals, and provides for the identification, expression, and development of a number of intelligences (Gardner, 1983, 1993, 1998; Ramos-Ford & Gardner, 1997; Viadero, 2003; Vialle, 1995). This theory serves as a catalyst to assist teachers provide appropriate classroom opportunities for all students, through differentiated

curricula (Cline & Schwartz, 1999). Some authors, however, disagree with this inclusive approach to 'intelligence', arguing that it reduces the need for separate gifted programs, with consequent adverse outcomes for gifted students (Delisle, 2003). Nevertheless, the multiple intelligences approach is compatible with a Montessori setting, and was employed to some extent at the school in the present study.

Renzulli's conception of giftedness involves the 'Confluence of Three Areas', specifically the areas of above average IQ, creativity and task commitment (Renzulli, 1997, 2002; Renzulli & Reis, 1986). The 'Enrichment Triad/Revolving Door Model' is a comprehensive plan for school-wide enrichment. It consists of five components, namely, assessment of student strengths, curriculum compacting, Type I Enrichment - general exploratory activities, Type II Enrichment - group training activities, and Type III Enrichment - individual and small group investigations of real problems. Research related to this enrichment model has shown it to be beneficial for gifted children (Reis & Renzulli, 2003). Aspects of this theory have been applied in the Montessori school under consideration, as it was relevant to the development of all children and it encompassed creativity and task commitment, which were parts of the 'whole child' often neglected by a focus on IQ.

The 'Abilities and Talents by Domain' approach recognised different domains or spheres of giftedness, such as academic, artistic and psycho-motor (Gagné, 1985, 1997, 1999). The Gagné (1985) definition of giftedness was adopted in this study, and related theory was introduced to the teachers during the professional development phase of the research.

2.9 Provision for Gifted Children

Curriculum Differentiation

Many authors in the field of gifted education consider that the program for the gifted needs to be based on differentiating the curriculum (Maker & Nielson, 1995; Pears, 1988, 1996b; Purcell, 2002; C. A.

Tomlinson, 1995; C. W. Tomlinson, 2002; Troxclair, 2000; VanTassel-Baska, 1994, 2002a; D. Wood, 2003). The characteristics of a differentiated classroom and the process to move towards differentiated instruction is outlined by various researchers, working in different educational contexts (Gross et al., 2001; Holden, 2003; Knight & Becker, 2000; Lawver & Kottmeyer, 2004b; Magee, 2003; Maker & Udall, 1985; Newhouse-Maiden & Williams, 1996; Torzsa, 2003). An extensive array of literature on this topic, based on research evidence, has been developed to assist teachers develop differentiated curricula (Association of Independent Schools of Western Australia, 2003a, 2003b; Bailey, 2004; Burns, 2002; Dinnocenti, 1998; Education Department of Western Australia, 1995; Farmer, 1996; Framingham Public School's Services for Gifted and Talented K-12, 2002; Kempe, 2003; Kennedy, 2000; Lawver & Kottmeyer, 2004a; Noble, 2002; Pemberton, 2000; Southern & Ferguson, 1996; TeAch-nology, 2001).

In a text on provision for the gifted, five precepts for curriculum differentiation for the gifted are proposed (Piirto, 1994, p. 378). First, the curriculum needs to be based on the learning characteristics of academically talented children, especially regarding pace, depth, learning through reading and active intellectual activity. Second, the curriculum should possess academic rigour, particularly regarding assessment. Third, it needs to be interdisciplinary. Fourth, the curriculum should consider six orientations, namely, personal relevance, technology, academic rationalism, social adaptation and reconstruction, development of cognitive processes and last, a means of producing insight. The final precept for curriculum differentiation is that it be balanced and integrated by including a range of learning areas.

From a different perspective, Maker (1993, 1995) identified four elements: content, process, product and learning environment, as the important components of a differentiated curriculum for the gifted. Another element, the teacher, is added by Renzulli (1997) in his conception of the 'Five Dimensions of Differentiation'. Content modifications include, for example, advanced material and differentiating specific materials. Instances of process modification involve self-directed learning, freedom of choice in activities and using higher level thinking skills, such as open-ended questions and activities. Product modifications refer to giving gifted students

the opportunity to produce high-level professional end-products, while environment differentiation includes providing a student-centered approach to learning that encourages initiative and independence. Finally, the teacher dimension requires that teachers be appropriately trained to meet the needs of gifted students. An outline of Maker's (1993; 1995) four elements is included in the information prepared for Western Australian teachers by the state education department (Education Department of Western Australia, 1995). However, there is no mandate for Montessori teachers to use this material.

Programs for gifted students need to take into account different levels of giftedness (Gross, 1993; QuanSing-Rowlands, 2004). Researchers recognise degrees of giftedness and argue that these different levels of giftedness require the application of different educational strategies (Gross, 1993; 2002a; Silverman, 2003b). Guidelines prepared for teachers similarly indicate the need to cater for different levels of giftedness (Association of Independent Schools of Western Australia, 2003b; The Gifted Education Research Resource and Information Centre, 2002, 2003). This understanding of levels of giftedness is compatible with the Montessori philosophy of accepting each child as unique. At the Montessori school involved in the present study, no single-focused program for all gifted students was considered because each gifted child was recognised as having a unique profile, and thus would require an individual program.

Caution needs to be applied when reviewing the literature on programs for gifted children. There is considerable literature on ideas for classroom provision for the gifted, but not all of it is research based. Research is required to show whether particular strategies are effective. A key program strategy that has been found to be effective for gifted children is curriculum compacting (Davis & Rimm, 1998; Gross et al., 2001; Troxclair, 2000; Winebrenner, 2000; Winebrenner & Berger, 1994). This refers to eliminating, enriching and accelerating aspects of the curriculum (Gross, 1993; Gross et al., 2001; Hannon, 1995; Wahl, 2001 re. the Iowa Acceleration Scale). Note that definitions of enrichment and acceleration vary between authors and this contributes to difficulties in comparing research findings (Braggett, 1992, p. 68; Education Department of Western Australia, 1995, p. 8; Gifted and Talented Children's Association of Western Australia Inc., 2001b; Gross, 1993, p. 205; Wilson, 1996, p. 84). Overall, research on acceleration has been found

to have positive results, namely, that acceleration is educationally and socially advantageous for highly gifted learners when the school environment supports the use of this strategy (Gross, 1993, p. 243).

Other effective program strategies for gifted children include using conceptual thematic units, questioning strategies and creative thinking skills (Davis & Rimm, 1998; Kaniel, 2003; A. Martin, 2003b; Pears, 1996b; VanTassel-Baska, Avery, Little, & Hughes, 2000; Watson, 2003). There is a plethora of literature available to support teachers employ these strategies in the classroom (Black, Brown, Moulton, & Roberts, 1992; Dalton, 1985; Langrehr, 2002; Layton, 2001; J. L. Martin, 1989; Rundus, Lenegan, & Kelly, 2002).

Another frequently used strategy that has been found to be effective, is to encourage gifted students to be involved in independent study, with the associated development of study skills and access to a wide range of resources (Maker & Nielson, 1995; VanTassel-Baska, 1994, p. 371; Winebrenner & Berger, 1994). In this context, use of the World Wide Web as a resource for research has been found to be beneficial (Bulls & Riley, 1997; Virtual School for the Gifted, 2004). Independent study is a strategy that Australian teachers have been reported as using (Braggett, 1992; Gifted and Talented Children's Association of Western Australia Inc., 2001a, 2001b; New South Wales Gifted and Talented Association, 2004; Wilson, 1996). Prior to the current research being undertaken, this strategy was frequently employed for all upper primary children at the Montessori school in the present study, because it fostered independent learning, a key value in the Montessori system of education.

A final program strategy for the gifted to be considered here is obtaining a mentor for the gifted child. Researchers (Braggett, 1992, p. 129; Maker, 1993, p. 313) have found this to be a worthwhile strategy and materials are available to assist teachers obtain mentors (Education Department of Western Australia, 1995; Sunderland, 2004; Vasilevska, 2001).

Within the broad range of program strategies discussed above there are many approaches that are compatible with the Montessori learning environment. Other strategies that may be employed are outlined in Appendix 2. In conclusion, each gifted child requires that his/her individual needs be determined so that appropriate curriculum differentiation can be undertaken. To do this an Individual Education

Plan would need to be developed to clarify and monitor the student's unique program. For example, a particular child's program may involve, in bald terms, some aspect of curriculum compacting, having a mentor and enhancing thinking skills.

Provision for Twice-Exceptional Children

Some research has been undertaken in the area of provision for twice-exceptional children, particularly during the 1980s in the United States of America. Based on the research, various methods, techniques and programs to support these gifted children experiencing learning difficulties were outlined (L. J. Baldwin & Gargiulo, 1983; Fox et al., 1983a). For example, Starnes, Ginevan, Stokes and Barton (1988) identified three general groupings within a sample of forty-one gifted students with learning difficulties. First came students with unrecognised ability and unrecognised problems, who were operating at grade level. The second group included students with high verbal skills and some recognition for their giftedness, but no recognition of their learning difficulties. The final group consisted of students who had been recognised for their learning difficulties but not for their giftedness. Different programs were prepared for these different groups. An aspect of the adaptive programming for the last group, for instance, included providing "motivation and challenge through self-chosen and interest-based enrichment activities following a given theme, while compensatory strategies were developed for areas of weakness" (Starnes et al., 1988, p. 13). So, students in this group with writing difficulties, for example, were given access to computers and hands-on activities in their learning environment. More recent research has led to the development of other features in programs to support twice-exceptional students (Ivicevic, 2004; Mann, 2002; Silverman, 2003a, 2003b; Warshaw, 2003a; Willard-Holt, 1999). For instance, Winebrenner (2003) advocated a number of programming strategies for these students, such as, presenting the students with the 'big picture' before teaching its components, using musical chants, raps and rhymes, making everything visual by using graphic organisers, charts, graphs, timelines, vocabulary maps, and building movement into learning tasks. These strategies were considered important because global information processing (in contrast to analytic information processing) and multi-sensory learning have been found to be effective with twice-exceptional students (Cline & Schwartz, 1999; Munro, 2002b; Neumann, 2004a).

From a Multiple Intelligence perspective, there are very few Australian studies of MI programs designed specifically to cater for twice-exceptional students. Some programming ideas to support twice-exceptional students, within a Multiple Intelligence model, have been published, but these are characteristically brief and not linked to research evidence (McGrath & Noble, 1995, p. 14). The only recent Australian study of twice-exceptional children, conducted by Konza and Moroney (1999), involved three case studies of children with learning disabilities. These authors found that it was important to base the children's programs on the Intelligence/s that manifested their gift/s, rather than on the Intelligence/s that reflected their difficulties (Konza & Moroney, 1999, p. 6).

On the other hand, in the United States of America, numerous authors have reported at length on Multiple Intelligence research and programs that provide for gifted children with learning disabilities, for example, Cline and Schwartz (1999) presented a longitudinal case study of a boy with dual exceptionalities. The student manifested his giftedness in high comprehension and vocabulary scores and outstanding problem-solving ability. His learning difficulties arose in accurate word reading and spelling, as well as gross and fine motor deficits that affected handwriting and sport. Initially, the child was only involved in slow-paced, remedial programs to support his reading difficulty. However, it was found that participation in a gifted program that emphasized his gifts and allowed independent study on a topic of interest, was pivotal in motivating the student and eventually resulted in his achieving an A grade average for all subjects (Cline & Schwartz, 1999, p. 75). This finding, which agreed with Konza and Moroney's (1999) conclusion, supported the notion of working with the Intelligence/s that involve the children's gifts, with teachers providing "Activities, materials, and knowledge ... at the level of cognitive ability, not skills" (Cline & Schwartz, 1999, p. 79).

Literacy Issues of Provision

In order to understand the literacy issues of provision, children who are gifted in literacy will be discussed first, followed by an examination of research evidence on gifted children who experience difficulties in literacy learning.

Gifted in Literacy

Although there is considerable research evidence available on recommended classroom provision practices for gifted students (Hertzog, 1998; Reis, Gentry, & Maxfield, 1998; VanTassel-Baska, 2002a; VanTassel-Baska et al., 2000; Winebrenner, 2000, 2003), there is comparatively little specifically on literacy and giftedness. One such author argues that there are multiple forms of literacy in which gifted students can participate in different contexts (Knight, 2002). In considering the functional literacy demands on gifted students, research has shown that students may be gifted in all aspects, or parts (such as oral language), or have difficulties in varying degrees with reading, writing and spelling (Ansell-Shepherd, 2003; Liddle & Porath, 2002; Munro, 2002b).

Giftedness with language may take many forms, such as, reading ability, creative writing, formal writing, spelling, vocabulary and oral language (Damiani, 1997; Gross, 1993). Many gifted language students are copious and avid readers, excellent spellers and writers. For example, Gross' (1993) Australian research employed multiple case studies with fifteen exceptionally gifted children, aged between 5-13 years. Using a reading record questionnaire, it was found that these students read books written for children 5-7 years older than their chronological age and they preferred the science fiction/science fantasy genre (Gross, 1993, p. 165). It was concluded that gifted readers need enrichment at a level at which they are currently reading, not just access to the enriched reading material at chronological age level (Gross, 1993, p. 162). With regards to spelling, all fifteen children had spelling achievement levels, as measured by the South Australian Spelling Test (Westwood, 1979), considerably in advance of their chronological ages, with nearly half the cases four or more years in advance (Gross, 1993, p. 146). Furthermore, these students wrote more sophisticated stories, essays and assignments than their same age peers, using more complex vocabulary. Gross (1993, p. 272) recommended that provision for these children involve on-going individualised acceleration, including work with mentors who have high-level expertise in the child's area of giftedness.

Other researchers found that some of the young gifted child's high ability in reading was correlated with excellent phonological awareness skills (McBride-Chang, Manis, & Wagner, 1996). The research sample, from regular classrooms in

public schools in Florida, U.S.A., included forty-two 3rd and 4th graders with average IQ scores and forty-nine 3rd and 4th graders with above average IQ scores, as well as sixty-one pre-reading kindergarten students. All the children completed a large battery of tasks, including measures of block design, picture completion, vocabulary, digit span, segmenting compound words, syllables and phonemes, single sound identification and phoneme deletion. The authors found three correlates of phonological awareness, namely, speech perception, short-term verbal memory and general cognitive ability (McBride-Chang et al., 1996, p. 29).

Some of the other characteristics displayed by many students gifted in the language area include thinking clearly and originally, understanding and applying abstract terms, increasing specific vocabulary, frequently writing at length, comprehending complex concepts and asking searching questions while discussing subjects in depth (Abbott, Chessell, Robinson, & Sykes, 1991, p. 145; Gross, 1993, p. 146). With regards to provision for students gifted in language, there is a range of effective program strategies, supported by research evidence, that teachers can draw on to challenge and enhance their students' development. Such strategies include acceleration that exposes the child to a curriculum that more closely approximates the level of intellectual capacity, and placement in special interest groups, for instance 'literature circles' in which gifted children analyze the books they are currently reading (Daniels, 1994; Drapeau, 2002; Gross, 1993; Halstead, 1988; Holm-Cippolin, 2002; Small & Strzepek, 1988; Van Deur, 1996; Varley, 1994).

Gifted with Learning Difficulties in Literacy

Identifying gifted students with learning difficulties in literacy is a complex issue. Nevertheless, some guidelines on the definition, identification and education of these students, derived from research evidence, can be gleaned from a number of sources (Fox et al., 1983a; Munro, 2002c; Supplee, 1990). For example, due to the problems in identifying the gifted with learning difficulties it has been recommended that we "move away from using rigid definitions and cut-off scores to specify who receives special programming" (Brody & Mills, 1997, p. 292). Research has also shown that it may be difficult for teachers to recognise these students as gifted, instead focusing their attention on the students' learning difficulties (Liddle & Porath, 2002; Starnes et al., 1988; VanTassel-Baska, 1992).

Some research on gifted students with learning difficulties in literacy has been undertaken. An early longitudinal case study of a gifted boy with learning difficulties in literacy was conducted by Rosner (1983). The student experienced difficulties with word recognition, spelling and writing. An examination of the child's lowest scores in the WISC-R intelligence test all involved the ability to attend and concentrate. In addition, the low Coding Subtest score involved perceptual motor co-ordination. The researcher concluded that the boy required very careful programming in the school situation:

He should have access to all of those opportunities available to gifted youngsters; at the same time, he should be provided with supportive, tutorial work in areas such as reading and writing so that he can fully realise his potential before the increased frustration overwhelms his basically good learning skills (Rosner, 1983, p. 149).

This early study of a gifted child with learning difficulties in literacy pointed to the complexity of the issue. The child presented with a unique combination of gifts and difficulties that required initial identification, comprehensive assessment and individualised provision in the classroom context.

The majority of research on gifted children with learning difficulties in literacy has been related to reading (E. E. Cooper et al., 2004; Fox, 1983; Fox et al., 1983a; Munro, 2002b, 2002c). For example, a study of 432 students aged 6-14 years, attending a reading clinic at Temple University, U.S.A. (Fox, 1983), found a significant percentage of students attending this clinic had high IQ scores. The number of learning-disabled/gifted children in the clinic population was as high as 17 percent in 1979 and 10 percent as early as 1956. The author concluded that it was likely that the vast majority of learning-disabled/gifted children are "unrecognised as such because their disability is not severe enough for their performance to be noticeably below grade-level expectations on standardised tests or in normal classroom functioning" (Fox, 1983, p. 137). Thus, further research was recommended to describe the "various patterns of strengths and weaknesses that might be found among this [learning-disabled/gifted] population so that better educational prescriptions and techniques" could be devised (Fox, 1983, p. 138).

A recent Australian study investigated the reading characteristics of students termed "gifted literacy disabled" (Munro, 2002b). This researcher defined gifted

literacy disabled students as a subset of gifted students with learning difficulties (Munro, 2002b, p. 4). This again illustrates the ongoing problem of no generally accepted definition of the gifted with learning difficulties.

Munro's (2002b) sample consisted of thirty-seven gifted literacy disabled students between the ages of 6-10 years. These students, from schools in Melbourne, displayed a discrepancy in literacy performance of at least one standard deviation below the mean for their chronological age in at least one of reading prose accuracy, prose reading comprehension, or isolated word reading accuracy (Munro, 2002b, p. 4). Spelling and phonemic awareness were also tested. Scores on the cognitive factors of the WISC-III identified two groups. Group one consisted of twenty students with superior performance on both Verbal Comprehension and Perceptual Organisation, while the group two included seventeen students with superior performance on Perceptual Organisation. The two groups differed in their literacy patterns. Group two showed a greater level of difficulty with all measures of literacy, at least one standard deviation below their expected score. In contrast, the group one students showed lower performance on isolated word reading and spelling. There was no difference between the two groups in phonemic awareness; both groups showed delayed phonological awareness. The literacy disability was attributed to a specific preference for the use of global rather than analytic information processing strategies (Munro, 2002b, p. 11). This influenced phonemic awareness knowledge and consequently letter cluster knowledge. It was thus argued that group one students were more able to compensate for their literacy disability, as they had better letter cluster knowledge than participants in group two who employed global strategies (Munro, 2002b, p. 11).

Numerous implications for provision for gifted literacy disabled students were suggested by the results of Munro's (2002b) study. Diagnostic procedures were needed to identify those aspects of reading that supported the reader and those that accounted for the difficulty. Arising from this diagnosis, there was then the need for differential instruction that targeted the specific literacy learning needs of each student. Students who were able to comprehend text adequately but had difficulty with word level reading required different instructional support compared to students who had both comprehension and accuracy difficulties (Munro, 2002b, p. 11).

A case study of an American boy with dyslexia and spatial-temporal gifts documented the child's educational experiences from pre-school to Year 5 (E. E. Cooper et al., 2004). Identification procedures and interventions were reported. This student was found to have a 44 point difference between Verbal (101) and Performance (145) scores on the WISC-III assessment. A wide range of strategies were employed to support the child's dyslexia, such as, withdrawal for direct reading instruction, multisensory experiences to enhance memory of letters and words, the use of graphic organisers, and access to a computer to support writing. The child's spatial-temporal strengths were also incorporated into these lessons, for example, in the creation of language mobiles, clay and foil letters and words. Furthermore, in recognition of his gifts, the student was involved in extension activities. These activities were in the field of science, an interest area of the child, which utilised his 2D/3D strengths and enabled a hands-on discovery approach. By Year 5 this student worked at grade level in most subjects; this included significant progress in reading.

Some studies have investigated gifted students with learning difficulties in writing (Ingleheart, 1998; Kokot, 2003a; Liddle & Porath, 2002; L. Webb, 2004). In a longitudinal case study of a gifted Texan boy with writing difficulties, Ingleheart (1998) followed the progress of the student from primary to tertiary levels of education. This student received remedial education support throughout his primary school years, but access to computers with spell checking capability at high school enabled him to show his giftedness, and ultimately undertake engineering studies at university (Ingleheart, 1998). With regards to provision, other authors similarly recommend assistive technology to support gifted students with writing difficulties (Fox, Tobin, & Schiffman, 1983b; Liddle & Porath, 2002; Minton, 2002; Stewart, 2002).

Another case study examined the neurobiological issues impacting on a 7 year old South African girl, who was dyslexic and gifted with severe learning difficulties in writing (Kokot, 2003a). A neurodevelopmental approach to learning, known as HANDLE, an acronym for Holistic Approach to NeuroDevelopment and Learning Efficiency, was employed. Part of the initial assessment included observation of the girl, considering for example, things that distracted her attention, the child's most successful learning modalities, and the physical-environmental conditions that affected learning. HANDLE practitioners developed a plan that

included specific, sequenced and prioritised physical exercises to address the neurobiological weaknesses in the girl's vestibular system, as well as specific exercises to develop the visual functions of tracking and binocularity. This training program resulted in overall improved literacy outcomes for the student (Kokot, 2003a, p. 53). Similar writing gains were reported by Webb (2004), in case studies of two gifted boys, aged 9 and 10 years, who participated in individualised programs that employed specific physical exercises to address their writing difficulties.

Research has shown that written expression is a very poor indicator of giftedness in children (Liddle & Porath, 2002, p. 19). Thus gifted students with writing difficulties may not be identified as gifted by the teacher, if other identification criteria are not employed. In the Liddle and Porath (2002) study data was obtained from a sample of seventy Canadian children, aged 6-15 years, and scoring greater than 120 on at least one IQ or achievement subscale. The research found that this sample of children displayed spelling ('transcription') skills that were significantly depressed compared to their word reading ('decoding') skills. Furthermore, the research provided evidence that there was a:

... greater prevalence of decoding-transcription output discrepancies in young gifted children than in the general population ... reflecting an asynchrony between accelerating decoding skills and the more linear development of transcription skills (Liddle & Porath, 2002, p. 18).

In addition, it was found that these discrepancies were particularly marked during the primary school years, reaching a maximum around 12 years of age (Liddle & Porath, 2002, p. 18). Recommended strategies to support these students included, for example, the use of other modes of presentation such as oral reports, information technology skills and audio-tapes (Liddle & Porath, 2002, p. 19). The findings of this research also suggested that writing difficulties in the gifted could be an indication of other problems, such as a phonological awareness difficulty, and that such problems required identification, then specific targeted intervention (Liddle & Porath, 2002, p. 19). These authors recommended that more research was warranted to elucidate the issues directly relevant to the identification of children who were gifted with learning difficulties in writing and to the nature of their educational needs with regards to provision (Liddle & Porath, 2002, p. 19).

No Australian research on gifted students experiencing writing difficulties has been found. This situation, together with the Montessori teachers' recognition of this problem in the school, led to the particular focus of the present study, that is, twice-exceptional children with difficulties in writing.

Evaluation of Gifted and Talented Programs

Researchers recommend that programs for the gifted need to be evaluated to determine their "success", including the efficacy of the various program components (Davis & Rimm, 1998, p. 414). Criteria related to the effectiveness of different types of provision need to be established, which incorporate assessment of student, teacher and whole-school outcomes. Despite difficulties in the evaluation of gifted programs (Davis & Rimm, 1998, p. 414), such evaluation would enable the development of a growing body of knowledge on effective programs for the gifted, rather than simply programs that have been conducted. Numerous models for organising gifted program evaluations have been developed (Davis & Rimm, 1998, p. 415; Education Department of Western Australia, 2004a; VanTassel-Baska, 1992, p. 131; Winebrenner, 2000, p. 64). The staff professional development phase of the current research included a component on gifted program evaluation, outlining the alternative models the school could adopt for the evaluation of its own forms of provision for the gifted. Participants at this professional development also completed a survey as part of the evaluation of the training program itself.

2.10 Literature on Methodology

The current research used action research and case study methodology. Thus it is predominately a qualitative study, although some quantitative analysis was undertaken.

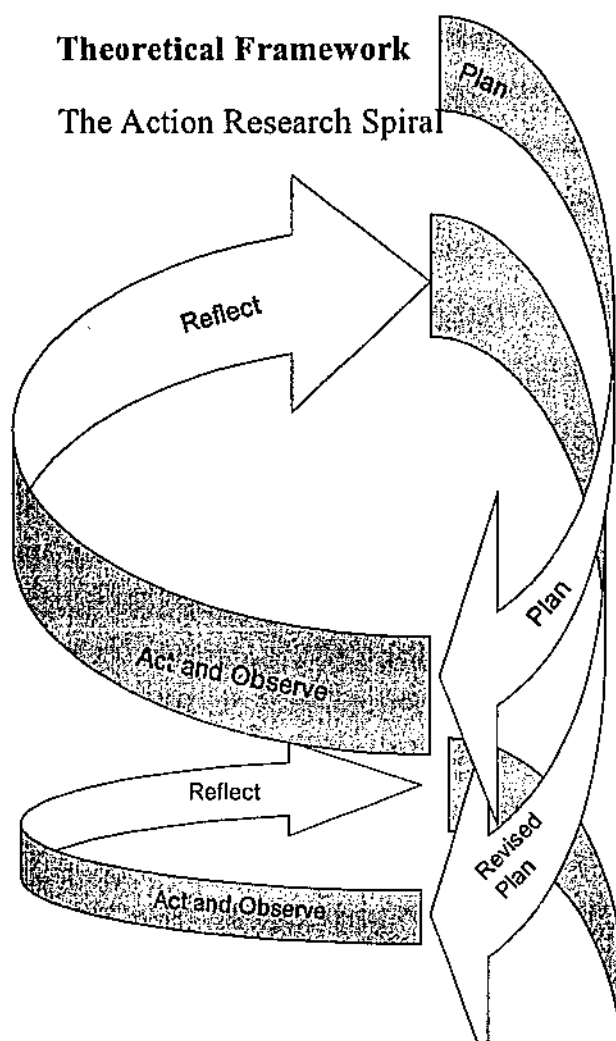
Action Research

Action research is designed to solve problems and produce practical outcomes. The method of action research usually involves participants taking part in the following cycle of stages (Angus & Gray, 2001, p. 86; Grundy, 1995, p. 12):

- Clarification of the problem.
- The collection of information about the problem.
- A review of the information.
- The generation of an intervention strategy.
- A review of whether the strategy worked.

This cycle of stages can be summarised in the Action Research Spiral shown in Figure 2-1. A plan is made to resolve an agreed problem, the plan is implemented, outcomes of the plan are observed and reflected upon, a modified plan subsequently developed to address the results of the initial plan, and so the cycle continues. So, if the intervention is not successful, the cycle is repeated, using the information that has already been learned about the problem. As Kemmis & McTaggart (1988, p. 10) state:

To do action research is to plan, act, observe, and reflect more carefully, more systematically and more rigorously than one does in everyday life; and to use the relationship between these moments in the process as a source of both improvement and knowledge.



**Figure 2-1. Model of the action research spiral
(Kemmis & McTaggart, 1988, p. 21)**

In action research, the role of the researcher is that of colleague. "Action research is not research done on other people. It is research into one's own work practices with and for others" (J. Webb, 2000, p. 18). Furthermore, teacher action research has been found to be a powerful tool for changing policies, the curriculum and culture of schools (Dadds, 1995; Richardson, 1994b; Scott, 2004; J. Webb, 2000). In the Dadds (1995, p. 170) study, for instance, the teacher-researcher effected significant policy change in a school where she worked, with colleagues using the new, agreed policy document to inform their teaching.

There are a number of orientations to teacher research; specifically, that which is concerned with the improvement of practice, the development of an alternative knowledge base for understanding teaching and learning, and finally, actively setting out to create change beyond the individual teacher (Grant, 2000). These three orientations may, or may not, be mutually exclusive. In the present study the researcher is a teacher in a school and within that school there is some recognition that there is a need for improved identification and provision for gifted students, particularly those with learning difficulties. Thus, in the case of this research, the three categories overlap, as there is a desire for improved practice, an opportunity for an extended knowledge base, and change is an intended outcome.

The principles of action research include positive relationships, effective communication, community participation and the inclusion of all relevant stakeholders (Stringer, 1996, p. 25). These principles are fully compatible with the Montessori philosophy. Stakeholders, for example, include all those who will participate in information exchange, decision making and will be affected by the outcomes (Webb, 2000). In the current study all the teachers were involved in the research process.

The preceding discussion suggests that action research is a clearly defined method. However, action research can differ according to participation, aims, settings, project topic, and inquiry techniques (Kemmis & McTaggart, 2000; Tripp, 1999, 2001). For instance, Tripp (1999, p. 215; 2001, p. 5) identified four modes of participation: compulsion, co-option, co-operation and collaboration. The compulsion mode involves the participants having no choice about participating; they simply must participate. Co-optees participate by doing what is asked of them. Co-operating participants have the right to withdraw from the research, but in terms of topic and direction it is the researcher's project. Collaboration occurs when all participants work together equally. To fit within the confines of this research project, the present study predominantly operated in the 'co-operation' mode.

Guidelines on how to collect and manage action research data are presented by various researchers (McNiff, Lomax, & Whitehead, 1996; Stringer, 1996). Some of these techniques for dealing with the data, such as using a research journal, observation and interviews, were employed in the current research.

There are some limitations of action research as a research method. These include reliance on subjective judgements, high risk of bias because evaluation of one's own efforts are involved and the findings are generally applicable only to the setting where the research was undertaken (Webb, 2000, p.19). However, the shortcomings can be minimised by the use of 'triangulation'. Triangulation involves collecting data from a variety of sources, settings, time frames, research methods and theoretical perspectives, which are preferably independent of one another (Cherry, 1999, p. 62; Patton, 1990, p. 464; J. Webb, 2000, p.19). This maximises both the internal validity of the process and generalisability. Other techniques that minimise the shortcomings of action research involve using cyclical processes which encourage the researcher to continually test her ideas in action, asking colleagues for critical and supportive feedback, and lastly, working 'robustly' with researcher subjectivity by employing reflective techniques and co-operative inquiry (Cherry, 1999, p. 79; J. Webb, 2000, p. 19).

Teacher Change

Attitudes are socially learned and expressed; they are also changed socially through social interaction (Hogg & Terry, 2000, p. 1). Attitudes provide guidelines for teachers to judge their environment, as well as anticipate and cope with recurring events (Eagly & Chaiken, 1993, p. 559). This understanding of the socio-psychological functions of attitudes was recognised in the present study. Thus the process of teacher change was planned to be a social, co-operative endeavour. The current research therefore adopted a concerns-based approach to teacher change (Hall & Hord, 1987; Richardson, 1994b). The assumptions underlying this approach include understanding the participants' concerns, recognising that change is a process, planning for what may happen during change, understanding that successful implementation in the change process involves policies and procedures, determining how each staff member experiences the change process, and finally, acknowledging that change facilitation is a shared responsibility (Anders & Richardson, 1994, p. 8; Fenstermacher, 1994, p. 40; Hall & Hord, 1987, p. 8; Richardson & Anders, 1994, p. 210).

An overarching concerns-based approach was relevant to the present study because the underlying assumptions of that approach were not only compatible with

the school's core values, culture and administrative processes, but also with theory underpinning the social change of attitudes. Thus, using a concerns-based approach meant that the change facilitator (the current researcher) worked *with* the teachers in a co-operative manner, in response to their needs, understandings and feelings, on an issue of mutual concern.

A current teacher change model, developed by Goodrum, Hackling and Pennie (2001), was incorporated into the action research cycle of the present study. This collaborative Australian secondary science project model for effecting teacher change incorporated overlapping sets of professional development, curriculum resources and participative inquiry, which facilitated teacher change (Goodrum et al., 2001). This model was adapted for use in the current research (see Figure 2-2). Research has shown that arguing about ideas in education and reflective teaching are vital components of the staff development and teacher change process (Richardson, 1994b). Thus one set of the teacher change model was renamed 'reflective participation' for the purposes of the present study.

Whilst it was recognized that teacher change was a component of the current research, the literature presented numerous studies that indicated resistance to attitude change can occur (J. Cooper & Stone, 2000; Falomir, Mugny, & Perez, 2000). Various theories of resistance to attitude change involving, for instance, the repression of conflicting ideas and the influence of personality types, have been the basis of experimentation (J. Cooper & Stone, 2000; Eagly & Chaiken, 1993). Thus, despite the inclusion of a teacher change model in the present study, awareness of resistance to attitude change was a known issue that could influence the research findings.

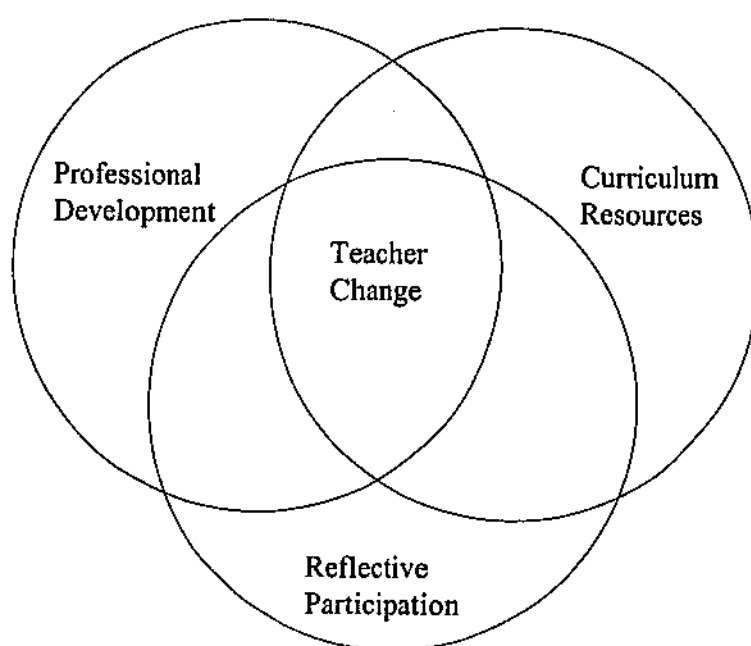


Figure 2-2. Model for effecting teacher change (adapted from Goodrum et al., 2001)

Professional Development

Research has shown that teacher change can be effected through professional development (Goodrum et al., 2001; Gross, 1997; Richardson, 1994b). Thus professional development was employed as one component of the current study. To assist preparation for presenting the professional development at the school, various researchers' guidelines for conducting successful training programs in gifted education, were analysed (Feldhusen, Haeger, & Pellegrino, 1989; Gross, 1997). Other authors' guidelines for training, in different spheres of education, were also reviewed (Baird, 1991; Connors, 1991; Costello, 1991; National Board of Employment Education and Training, 1993; Richardson, 1994b; Scriven, 1991; Sheffield, 2002; Williams, 1991). Key features of these programs included having internationally recognised research-based papers as course handouts (Gross, 1997, p. 18), and helping teachers understand their own attitudes and practices and debate alternative premises and practices (Richardson & Hamilton, 1994, p. 125). Information from this Literature Review was also used extensively in the preparation of the professional development for the current research.

Three broad topics were covered in the professional development presented as part of the current study. The first topic investigated the rationale, philosophy, definitions of giftedness, characteristics and needs of gifted children and identification criteria. The second topic covered curriculum models and curriculum development procedures and practices, as well as program models and practices. Finally, the administrative aspects of staffing, planning, implementing and program and student evaluation models were examined. The exact structure of the professional development, however, remained flexible. Time was allowed for the staff to raise related issues that concerned them and to democratically discuss new perspectives and practices. In the current research, this professional development was conducted as part of a case study at the Montessori school.

Case Study

A case study is an empirical enquiry that "investigates a contemporary phenomenon within its real-life context" (Yin, 1994, p. 13). Furthermore, the case is a "specific, complex, functioning thing", an "integrated" system (Stake, 1995, p. 2). It is also a "bounded" system, in other words a unit with set limits (Merriam, 1998, p. 27). Thus in the current research the bounded system is the school.

Guidelines on designing case studies, collecting data and analyzing case study evidence are presented by various authors (Merriam, 1998; Yin, 1994). Observing and undertaking document searches are some of the sources of evidence (Merriam, 1998, p. 71) used in the present study. Observing was chosen to be an important part of the case study research because the Montessori method of education is based on observation of the child (Montessori, 1964, p. 108). Case studies of gifted children identified as experiencing difficulties in writing were conducted.

Case study research can be valuable from a number of different perspectives. It is efficient, in that general conclusions may be able to be derived from a limited number of cases (Cherry, 1999, p. 104). It is also empirical, that is, field orientated (Stake, 1995, p. 47). Next, it emphasises analysis and interpretation (Stake, 1995, p. 47). Case study research can provide a 'landmark' case with specific conclusions (Cherry, 1999, p. 104). Furthermore, it can be used to generate change, by showcasing an idea or strategy (Cherry, 1999, p. 104). Another advantage of case

study research is that it provides an opportunity for holism, so that a phenomenon can be viewed from different aspects as well as being seen in its total environment (Stake, 1995, p. 47). Finally, it provides a template against which others can reflect on their own experiences with that phenomenon (Cherry, 1999, p. 105).

As with action research, case study research is limited by subjectivity, high cost in time and money, and that it may be seen to produce purely 'local' knowledge, from which it is difficult to derive general conclusions (Stake, 1995, p. 45). Thus it may be said that case studies may lack statistical validity and test-retest reliability (Cherry, 1999, p. 104). However, 'petite' generalisations, that is, those arising from a single case in a particular situation, do occur (Stake, 1995, p. 7). Such generalisations, combined with the use of triangulation, increase the validity of the study (Stake, 1995, p. 107).

In brief, action research and the case study approach were the research methods chosen for this study because these methods work to increase participants' understandings, solve problems, facilitate change and produce positive outcomes for gifted and talented students. Issues relating to the reliability and validity of these research methods are reviewed in the following section.

Reliability and Validity

Reliability

Reliability refers to whether the research findings would be replicated if the study were repeated. In quantitative research reliability is determined statistically. However, in qualitative research, reliability is more about whether the results are consistent and dependable. Reliability can be improved by the application of three techniques: triangulation, outlining the theoretical and contextual assumptions, and describing the audit trail (Merriam, 1998, p. 206).

Construct Validity

Construct validity is concerned with establishing the correct operational measures for the concepts being studied. It can be increased by using multiple sources of evidence, establishing a chain of evidence and having key participants review draft case study analyses (Yin, 1994, p. 33).

Internal Validity

Internal validity involves establishing a causal relationship, where a certain situation is shown to influence another situation. Six strategies can be employed to enhance internal validity in qualitative research (Merriam, 1998, p. 204). These strategies involve triangulation, conducting member checks, doing long term observations, involving the participants in all phases of the research, and finally, encouraging the researcher to employ a reflective journal to clarify ideas and biases.

External Validity

External validity refers to the generalisability of results to other situations. In qualitative studies, applying several techniques can enhance external validity. Using rich thick description, describing the typicality of the program/individual so that others can compare this with their own context, and using several cases to maximize the diversity of the phenomenon being studied, are valuable techniques for improving external validity (Merriam 1998, p. 208).

Thus there are many strategies that can be employed to enhance reliability and validity in qualitative research. Aspects of each of the above types of reliability and validity were incorporated into the methodology of the present study.

2.11 Summary

The needs and characteristics of gifted learners have been identified in this chapter, through reference to research in this field. Research in Montessori contexts indicates the needs of gifted learners are not always met. However, aspects of the broader Australian society together with features of Montessori contexts, appear to limit successful provision for some gifted students. Prior studies on teacher attitudes toward the gifted, teacher change, models and programs for the gifted, and the design of professional development training programs, suggest ways of facilitating change so that appropriate provision could be delivered for all gifted students in a school. The positive features of the research methods, action research and the case study approach, were discussed. The limitations of these methods were also examined,

along with an analysis of requirements to enhance reliability and validity, thereby providing informed support for the methodology chosen for the present study.

CHAPTER 3

METHODOLOGY

3.1 Action Research

This research employed action research methodology and was a qualitative and quantitative study designed to address school issues and produce practical outcomes for teachers and students. The study was conducted in a small, Western Australian Montessori school. It investigated teachers' attitudes towards the gifted and associated provision matters. The research was focused around the influence of professional development on teachers and consisted of three phases: professional development, curriculum and resources support, and reflective participation. Figure 3-1 shows in diagrammatic form, the action research spiral applied to the present Montessori context.

The action research results of this study will be relevant to and/or open to testing by teachers of primary students in Montessori schools. As far as has been ascertained no previous study of this nature in the Montessori environment has been conducted, so the research is worthy of investigation. As discussed in the Literature Review, there are several strategies to ensure that useful data is gained, while enhancing reliability and validity (Denzin & Lincoln, 2000a; Merriam, 1998; Yin, 1994), and these have been incorporated into the methodology of this research. Furthermore, this research will inform other people in other contexts, such as teachers of students in non-Montessori MAG classes, and inform other research.

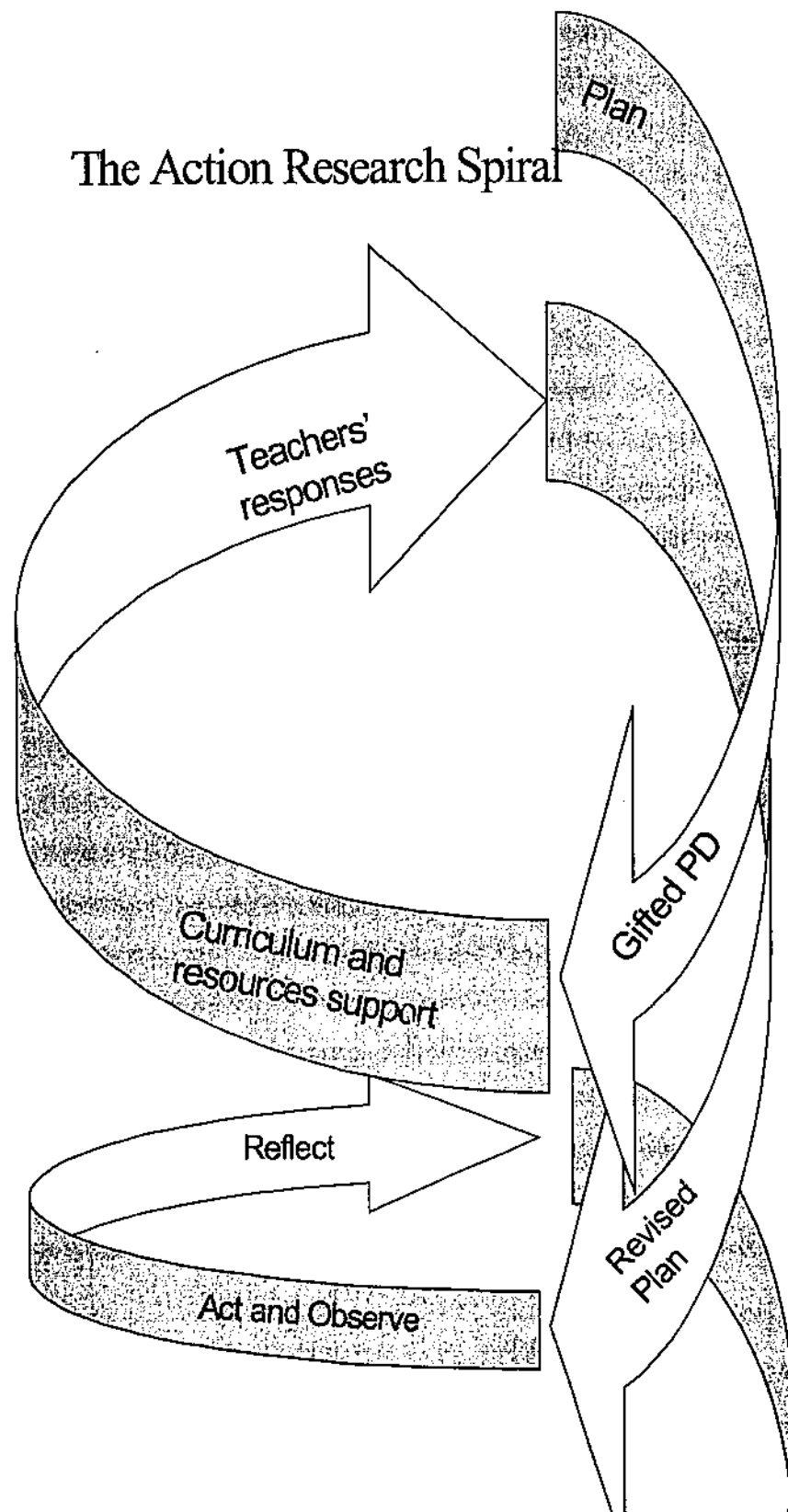


Figure 3-1. The action research spiral in the study context (adapted from Kemmis & McTaggart, 1988, p.21)

3.2 Participants

Target Population

The number of participants actively involved in the research included all twelve teachers at the school. These teachers included three from the Children's Houses, four from the junior primary classes and two from the senior primary classes (terms explained in Chapter 1), as well as three specialist teachers (Language Other Than English, The Arts, and Physical Education). There were also six gifted children identified by teachers as experiencing difficulty in writing. Case studies of two of these children were conducted.

Stakeholders

In this action research study the stakeholders included the children at the school, parents and volunteers, the Management Committee, the principal and the teaching staff, as well as colleagues for critical and supportive feedback to the researcher, as shown in Figure 3-2.

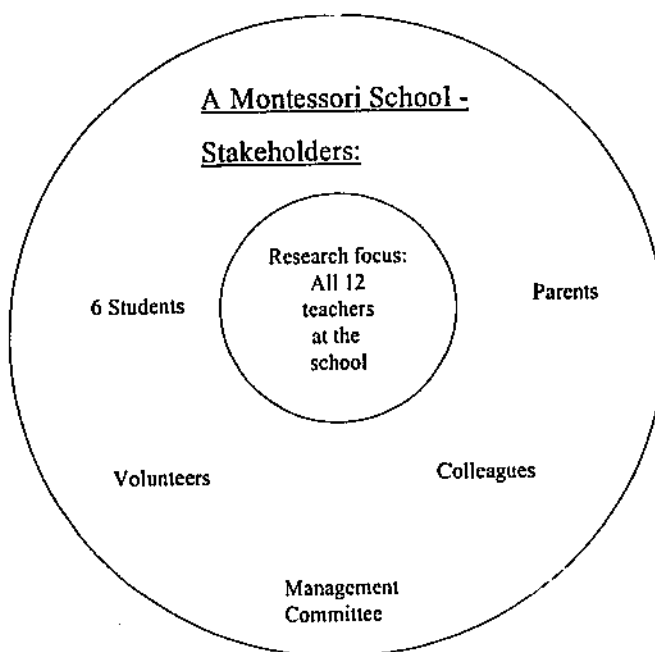


Figure 3-2. Research stakeholders

All stakeholders were informed about the research and involved in it to varying degrees, according to their own interest.

There were three main reasons why action research was the chosen methodology for this study of attitudes toward the gifted. First, it was compatible with the Montessori philosophy and values, as well as the culture and administrative processes currently employed at the school, since both these aspects encouraged involvement of all stakeholders, as did the action research approach. Next, it enabled the researcher and the school community to work as social partners (Greenwood & Levin, 2000; Kemmis & McTaggart, 2000). Third, a problem, namely provision for the gifted, existed within the school and some stakeholders recognised the need for change. Action research was therefore seen as a most appropriate research method in the democratic, parent-run, community context of the school.

A final point regarding stakeholders relates to enhancing the depth of dialogue between participants. As one author commented:

Some researchers have begun the process of moving the research philosophy in gifted education away from the heavy emphasis on quantitative, process-product methodologies towards qualitative schema providing depth of understanding concerning all stakeholders in the education process (Schultz, 2002, p. 205).

Thus the use of a variety of research techniques in the present study.

3.3 Design of the Study

This study predominantly involved qualitative methods of research, in the context of the action research. Some quantitative analysis was included, in the form of the teachers' attitude scale and quantitative data arising from the analysis of students' progress records. Refer to the Data Analysis section of this chapter for information on how the data was analysed.

The action research was focused around the influence of the professional development on teachers. It consisted of three phases:

1. Professional development.
2. Curriculum and resources support.

3. Reflective participation.

These phases are described further in the following Procedure section.

Method of Sampling

All twelve teachers at the school were involved in the research. Apart from the teachers, other samples involved in this study included students in the classroom context, parents and the researcher's peers. The students of particular interest in this study were gifted children with learning difficulties in writing. Six children had been formally identified as gifted and also manifested this particular difficulty in literacy. An Educational Psychologist or other related professional made the formal identification of giftedness. The writing difficulty was identified from the results of the Western Australian Literacy Assessments, that is, the benchmark testing for Years 3, 5 & 7 (Association of Independent Schools of Western Australia, 2003d); the South Australian Spelling Test (Westwood, 1999) and Student Outcome Writing (EasyMark, 1997), as well as in the psychological assessments. The focus of the investigations was on the types of classroom programs in which the six selected students were engaged. The parents in the research were any parents who provided information on the topic under investigation in their discussions with the researcher. The researcher's peers referred to colleagues (other than teachers) in the school community, such as volunteers, who had post-graduate education qualifications, as well as other post-graduate students who were willing to offer feedback.

Maximum Variation Sampling

Although all the teachers were involved in the research, some sampling of other data was required. The sampling method used was maximum variation sampling (Merriam, 1998, p. 62). Maximum variation sampling is a type of purposeful sampling. It aims to capture and describe central themes that cut across cases and derive significance from having arisen out of heterogeneity (Becker, 1998, p. 71; Stake, 1995, p. 4; 2000a, p. 446). As Patton (1990, p. 172) states "Any common patterns that emerge from great variation are of particular interest and value in capturing the core experiences and central, shared aspects or impacts of a program". With these understandings about sampling in mind, together with feedback from teachers about the different learning characteristics of the six selected

students, detailed classroom observations of two of these students were undertaken. One student was in an upper primary class and the other was in a lower primary class. Because of the sampling approach used it was anticipated that the student data might illustrate important common themes. The use of the maximum variation method also enhanced external validity (see Chapter 2).

The classroom observation sessions involved a second level of sampling. Maximum variation sampling was also used during the observation sessions, in that, the two students were observed at different times during the school morning, such as 9-10 a.m. and 10.30-11.30 a.m., and on different school days. Afternoon times were not included because these were predominantly whole class lesson times and specialist teacher lessons (such as sport), which did not provide as rich an opportunity to observe the children being self-directed and working independently.

Instruments

Selection of Techniques for the Collection of Data

A range of instruments was employed in this study. Guidelines on how to collect and manage action research data are presented by Stringer (1996) and McNiff (1996). Some of the techniques for dealing with the data, outlined by these authors, such as interviews, observation and a research journal, were used in the present study. An attitude scale to investigate the teachers' attitudes toward giftedness was also employed and will be discussed below.

Attitude Scale

As discussed in the Literature Review, Gagné and Nadeau developed a scale to examine attitudes toward giftedness (Gagné, 1991). This scale was employed in the present study. See Appendix 1. The historical context to the development of the scale, together with the findings of two recent Australian studies (S. M. Cooper, 1999; Gross, 1997) utilising this scale, was expected to provide interesting comparative data for the present action research study.

The scale consisted of 34 items and used a 5-point Likert Scale of "totally disagree" (1), "partially disagree" (2), "undecided" (3), "partially agree" (4) to

"totally agree" (5). Following Gagné (1991), these items were grouped into six factors (A, B, C, D, E and F described below) which focussed on attitudes toward the gifted and their education.

The attitude scale is interpreted by employing Gagné's (1991) guidelines. Means below 2.00 usually indicate a very negative attitude, while means above 4.00 indicate a very positive attitude. Means between 2.75 and 3.25 were interpreted by Gagné as reflecting an ambivalent attitude. Thus, means above 2.00 and below 2.75 indicate a negative attitude, while means above 3.25 and below 4.00 reflect a positive attitude. The scoring procedure outlined by Gagné (1991) required that the responses for some items be recoded (5=1, 4=2, etc.), to minimise the effect of participant responses based on perceived acceptable attitudes. The answers that are recoded include all Factor B items, as well as Item 25 in Factor C, Items 6, 20 and 21 in Factor E and Items 7, 10 and 29 in Factor F. The detailed scoring procedure and instructions are presented in Appendix 1.

Factor A: Needs and Support

Factor A deals with the needs of gifted children and support for special services. The relevant Factor A items of the Scale are 1, 9, 11, 14, 15, 24, 30 and 32, specifically:

- Item 1: *Our schools should offer special education services for the gifted.*
- Item 9: *Gifted children are often bored in school.*
- Item 11: *The gifted waste their time in regular classes.*
- Item 14: *The special education needs of the gifted are too often ignored in our schools.*
- Item 15: *The gifted need special attention in order to fully develop their talents.*
- Item 24: *In order to progress, a society must develop the talents of gifted individuals to a maximum.*
- Item 30: *Since we invest supplementary funds for children with difficulties, we should do the same for the gifted.*
- Item 32: *The regular school program stifles the intellectual curiosity of gifted children.*

Factor B: Level of Opposition

Factor B focusses on levels of opposition to the gifted based on ideologies and priorities. These items include 3, 4, 5, 12, 16, 18, 23, 26, 27 and 28; namely:

- Item 3: *Children with difficulties have the most need of special education services.*
- Item 4: *Special programs for gifted children have the drawback of creating elitism.*
- Item 5: *Special education services for the gifted are a mark of privilege.*
- Item 12: *We have a greater moral responsibility to give special help to children with difficulties than to gifted children.*
- Item 16: *Our schools are already adequate in meeting the needs of the gifted.*
- Item 18: *It is parents who have major responsibility for helping gifted children develop their talents.*
- Item 23: *The gifted are already favoured in our schools.*
- Item 26: *Tax-payers should not have to pay for special education for the minority of children who are gifted.*
- Item 27: *Average children are the major resource of our society; so, they should be the focus of our attention.*
- Item 28: *Gifted children might become vain or egotistical if they are given special attention.*

The teacher responses to all these items were recoded, as required by the scoring procedure (Gagné, 1991).

Factor C: Social Value

The social value of the gifted, for instance, whether they are seen as a valuable resource in our society or they become the leaders of tomorrow, are the attitudes investigated in Factor C. Four items of the scale pertain to this issue, specifically:

- Item 13: *Gifted persons are a valuable resource for our society.*
- Item 17: *I would very much like to be considered a gifted person.*
- Item 25: *By offering special education services to the gifted we prepare the future members of a dominant class.*
- Item 33: *The leaders of tomorrow's society will come mostly from the gifted of today.*

Only the responses to item 25 were recoded, in accordance with the scoring procedure (Gagné, 1991).

Factor D: Rejection

The attitudes in this factor are concerned with the rejection of the gifted by other students and teachers. The three relevant items are 19, 22 and 31:

Item 19: *A child who has been identified as gifted has more difficulty in making friends.*

Item 22: *Some teachers feel their authority threatened by gifted children.*

Item 31: *Often, gifted children are rejected because people are envious of them.*

Factor E: Ability Grouping

Four items, 2, 6, 20 and 21, relate to attitudes towards ability grouping of students, namely, whether gifted students should be provided for in regular classrooms or in special classes or schools. The specific items are:

Item 2: *The best way to meet the needs of the gifted is to put them in special classes.*

Item 6: *When the gifted are put in special classes, the other children feel devalued.*

Item 20: *Gifted children should be left in regular classes, since they serve as an intellectual stimulant for the other children.*

Item 21: *By separating students into gifted and other groups, we increase the labelling of children as strong-weak, good-less good, etc.*

Responses to all these items, except item 2, were recoded, as required by the scoring procedure (Gagné, 1991).

Factor F: School Acceleration

The attitudinal responses toward the effects of acceleration are examined in this factor. (Acceleration was defined in Chapter 1.) The relevant items in the scale explore issues such as parent pressure to accelerate a child and the academic and social adjustment of gifted students who may be accelerated. The particular items are 7, 8, 10, 29 and 34, and they state:

- | |
|--|
| <p>Item 7: <i>Most gifted children who skip a grade have difficulties in their social adjustment to a group of older students.</i></p> <p>Item 8: <i>It is more damaging for a gifted child to waste time in class than to adapt to skipping a grade.</i></p> <p>Item 10: <i>Children who skip a grade are often pressured to do so by their parents.</i></p> <p>Item 29: <i>When skipping a grade, gifted students miss important ideas (they have "holes" in their knowledge).</i></p> <p>Item 34: <i>A greater number of gifted children should be allowed to skip a grade.</i></p> |
|--|

Items 7, 10 and 29 were recoded, in accordance to the scoring procedure (Gagné, 1991).

Total Score

The total score is the sum of all the scores for all the factors (A to F), divided by the total number of items (34), to obtain the total score mean.

Interviews

The teacher interviews were designed to be open-ended and focused (Fowler, 1995; Merriam, 1998, p. 72; Patton, 1990, p. 289; Ryan & Bernard, 2000; Stake, 1995, p. 25). Open-ended interview questions allow respondents to answer questions in their own words. Such questions are also focused when they clearly ask about one issue only. The approach does not limit answers to those expected by the researcher. The interview schedules also included the opportunity for teachers to draw concept maps (Lewis, 2000; Ryan & Bernard, 2000; Schuster, 2002).

The initial interview schedule consisted of fourteen questions. First teachers were asked to show their conception of 'giftedness' using a concept map. The interview questions that followed investigated the identification of gifted students, underachievers and gifted students with learning difficulties, in each of the teacher's classes. The interview concluded with questions about policy and classroom provision for gifted children. The second interview schedule consisted of twenty-one questions. Additional questions were included in this schedule because of issues raised during the first application of the schedule. The interview schedules can be seen in Appendices 3 and 4.

Observation

Classroom observations of two of the six selected students were conducted in this study to provide evidence about provision for gifted students. Thus, for instance, one gifted child with learning difficulties in writing, was observed between 9.30am and 10.30am on Monday, between 9am and 10am on Tuesday, between 10.30am and 11.30am on Wednesday, 10am and 11am on Thursday, and 11am to 12 noon on Friday, in accordance with the method of sampling outlined previously.

Conducting classroom observations was seen as another source of evidence for corroboration of stated levels of classroom provision. The understandings of various commentators on this technique were incorporated into the implementation of observation in this study (Angrosino & Mays de Perez, 2000, p. 678; Merriam, 1998, p. 94; Patton, 1990, p. 205; Roeper, 1996; Ryan & Bernard, 2000; Stake, 2000a, p. 440; Yin, 1994, p. 106). Seven steps were identified in the observation process (Stake, 1995, p. 52). These steps are presented in detail in Appendix 5 but are briefly described as follows. The first step involved anticipation. For example, anticipation of spaces, persons, issues and attributes to be observed, record-keeping and coding systems. The next step was the first observation, including the gathering and validation of data. The third step involved developing conceptualisations for what was observed. The fourth step involved preparation for future observations, such as, redefining the role of the observer, clarifying record-keeping and coding systems, and reconsidering existing hypotheses. The following step involved making subsequent observations, gathering and validating data. Next came the analysis of data and further development of conceptualisations. The final step required the preparation of a draft report to provide 'member checks' (see Chapter 4).

Informal observations of the six selected children were undertaken to provide additional evidence about provision for gifted students, as well as information about their socio-emotional behaviour. These observations were made when visiting their classrooms, which was a regular occurrence in the role as support teacher at the school. Informal observations of the six children were also made when they were in the playground, during weekly playground supervision duty. Observations were recorded in field notes.

Research Journal

A reflective journal was employed by the researcher in this study, as advocated by other researchers (Kemmis & McTaggart, 2000, p. 573; Stake, 1995, p. 41; 2000a, p. 445). The journal enabled the researcher to reflect on all sources of data, the value of which has been highlighted by authors in the field (Cherry, 1999; Stringer, 1996; J. Webb, 2000). Alternative interpretations were considered in the development of assertions and generalisations about changes in staff perceptions and provision for the gifted, thereby clarifying the audit trail. The latter is an important consideration for the enhancement of reliability and validity, according to Merriam (1998).

Other Sources of Data

Data were collected from a range of other sources. These included anecdotal feedback from the parents of the six selected students as well as other members of the school community. Anecdotal feedback was also provided by teaching staff, at policy meetings, workshops and during informal discussions. In addition, feedback was obtained from professional colleagues, both from within and outside the school. Document searches of school records were also conducted and the document search guidelines outlined by Hodder (2000, p. 703) and Ryan and Bernard (2000) regulated this process. All these forms of data were used to provide evidence for themes that could arise in the research.

Data were also drawn from the school's records of standardised assessments for literacy outcomes. The assessments considered in the present study were Student Outcome Writing (EasyMark, 1997), the Western Australian Literacy Assessments involving benchmark testing for Years 3, 5 & 7 (Association of Independent Schools of Western Australia, 2003d), the South Australian Spelling Test (Westwood, 1999) and various reading assessments. The following three reading assessments were employed, depending on the age and reading ability of each child: the Torch Tests of Reading Comprehension (Australian Council for Educational Research, 1986; Mossenson, Hill, & Masters, 1995; Neale, 1999), the Progressive Achievement Tests in Reading (Mossenson, Hill, & Masters, 1995) and the Neale Analysis of Reading Ability (Neale, 1999). Records of these assessment results are kept in the school for

all children, so data for the selected students could be readily obtained. This data was used to provide evidence regarding the literacy outcomes of the selected students. In brief, all these other sources of data were included to increase the dependability and trustworthiness of the research findings.

Audit Trail of Data Collection

The following table summarises the audit trail in this study, in terms of the data types, time of collection, and the nature of the evidence sought.

Table 3-1

Audit Trail of Data Collection

Audit trail	Type of data	Date	Evidence
Attitude Scale	Gagné & Nadeau's attitude scale "Opinions about the gifted and their education".	Oct.-Dec. 2002 Oct.-Dec. 2003	Changes, if any, in 12 teachers' attitudes toward the gifted.
Interviews	Focused, open-ended researcher designed schedules.	Oct.-Dec. 2002 Oct.-Dec. 2003	Changes, if any, in responses of 12 teachers to questions on gifted identification/provision.
Concept Maps	Teacher-drawn models of their conceptions of 'giftedness'.	Oct.-Dec. 2002 Oct.-Dec. 2003	Changes, if any, in number of responses/detail of maps of teachers.
Classroom Observations	Field notes on 2 (of the 6 selected) students; followed 7 steps in the observation process.	Feb. - Mar. and Nov. - Dec. 2003	Changes, if any, of teacher attitude and in-class provision for the gifted; changes in student outcomes.
Anecdotal Feedback	Field notes.	Ongoing, Sept. 2002 - Dec. 2003	Reactions of parents and the school community; changes of teacher attitude and in-class provision for the gifted.

Table 3-1 Audit Trail of Data Collection (cont.)

Audit trail	Type of data	Date	Evidence
Professional Colleague Feedback	Field notes and draft research reports.	Ongoing, Sept. 2002 - Dec. 2003	Reactions to researcher assertions and generalisations.
PD Workshops	Workshop feedback schedules, audio tapes, field notes.	Oct. 2002 Feb. 2003 Sept. 2003	Reactions to PD content and research progress reports.
Staff Meetings	Minutes of meetings and field notes.	Fortnightly during school terms, Sept. 2002- Dec 2003	Reactions to proposals for gifted provision/research progress reports.
Informal Observations	Field notes related to the 6 selected students.	Ongoing, Sept. 2002 - Dec. 2003	Changes, if any, of teacher attitude and in-class provision for the gifted; changes in student outcomes.
Policy Meetings	Minutes of meetings and field notes.	3 in Mar. 2003; 1 each in April, June & Sept. 2003	Reactions to policy proposals/research progress reports.
Reflective Journal	Journal notes on all aspects of the research process.	Ongoing, Sept. 2002 - Dec. 2003	Reactions to researcher's assertions and generalisations.
Document Search	Official school documents: policies, procedures, enrolment information, strategic plan etc.	Sept. 2002 - Mar. 2003; Dec. 2003	Policy statements on identification/provision for gifted.
Standardised Testing	South Australian Spelling Test, Student Outcome Writing, WALNA benchmark spelling and writing assessments.	Dec. 2002 Mar. 2003 Aug. 2003 Dec. 2003	Student literacy outcomes and actions taken as result of student progress.

3.4 Procedure

Use of Triangulation

Information was collected from a number of sources, settings, time frames, research methods, instruments and theoretical perspectives, to increase the validity and reliability of the research. In particular, triangulation in the current study involved the use of a variety of:

- Sources - Teachers, students, parents, colleagues, records.
- Settings - Professional development sessions, individual interviews, classroom observations, staff meetings, policy committee meetings.
- Time frames – Continuous, with particular attention to the beginning and end of the research year.
- Research methods -Qualitative (action research and case study) and quantitative.
- Instruments - Attitude scale, concept map, interview schedules, observation, reflective journal.
- Theoretical perspectives - Theorists in gifted education (Gagné, 1985, 1997; Gardner, 1983, 1993; Maker, 1993; Maker & Nielson, 1995) and teacher change (Goodrum et al., 2001; Hall & Hord, 1987).

Phases of the Research

There were three main phases to the research procedure. Although there was considerable overlap between the professional development, curriculum resources and reflective participation phases, it was helpful to delineate them because they arose directly from the teacher change model and this aided clarification of the processes involved.

1. Professional Development Phase

The professional development phase consisted of two parts, one at the beginning of the research and the other at the end of the research period. It incorporated staff and parent in-service on gifted education, the administration of an

attitude scale, conducting teacher interviews, undertaking a records search and doing a series of classroom observations.

The researcher presented the professional development sessions. These sessions were designed using the professional development guidelines outlined by various researchers, including Gross (1997) and Feldhusen, Haeger and Pellegrino (1989). The attitude scale, together with the teacher interviews, assisted in the identification and description of teachers' attitudes and understandings about gifted education and their provision for gifted children in the classroom. Only class teachers participated in the in-depth interviews. Specialist teachers were not interviewed because they had limited contact with the children (one hour per week). Note that the interviews and the professional development sessions were audio-recorded to enable more detailed subsequent analysis. The records search involved an investigation of documents relating to policies and procedures, classroom provision, and identified gifted students (school reports, work samples, standardised and non-standardised educational assessments, reports by other relevant professionals). Finally, the classroom observation sessions were included to provide additional data on teachers' provision for gifted students with difficulties in writing. These observations involved a total of ten hours in two classes, with different half-hour time slots on different school days. The two classes were selected because they included students who were gifted but were also experiencing difficulties in writing.

In summary, the following activities were undertaken, in the given order, at the start of the research:

- Distribution of information letters and statements of disclosure and informed consent (Appendices 6-9).
- Administration of the Gagné & Nadeau attitude scale to teachers (15 minutes).
- Teacher interviews I (30 minutes each).
- Records search I.
- Classroom observations I (5 hours).
- Gifted and Talented professional development session I for staff (8 hours).
- Parent education session I (2 hours).

At the end of the field research some of the aforementioned activities were revisited to determine what changes had occurred:

- Re-administration of Gagné & Nadeau attitude scale to teachers (15 minutes).
- Teacher interviews II (30 minutes).
- Classroom observations II (5 hours).
- Records search II.
- Gifted and Talented professional development session II for staff (2 hours).
- Parent education session II (2 hours).

2. Curriculum and Resources Support Phase

The second phase of the research involved the development of a new gifted and talented policy by the staff and the subsequent application of this policy throughout the whole school. Gifted and talented curriculum and resources development was available for staff. This phase included the provision and use of required resources, as well as collaborative support for the staff by the researcher.

3. Reflective Participation Phase

The final phase of the research focused on staff participation in the action research process, thus the researcher monitored formal staff meetings, informal staff discussions and staff sharing of ideas and resources. This was achieved through participant observation and the researcher's ongoing reflective journal. A vital component of this phase was the documentation of the ebb and flow of the category of 'participation' (Tripp, 2001). Also, member checks were conducted throughout the study.

Research Timeline

Refer to the following table for an outline of the research timeline.

Table 3-2

Timeline for Data Collection

Data Collection	Semester 2 2002		Semester 1 2003			Semester 2 2003		
	Sep- Oct	Nov- Dec	Feb- Mar	Apr- May	Jun- Jul	Jul- Aug	Sep- Oct	Nov- Dec
Stage I								
Records search								
Teacher attitude scale								
Teacher interview								
Classroom observations								
Parent education feedback								
Informal observations								
Parent feedback								
Reflective journal								
Stage II								
Records search								
Teacher attitude scale								
Teacher interview								
Classroom observations								
Parent education feedback								
Informal observations								
Parent feedback								
Reflective journal								

Values and Ethics in Action Research

Although the research proposal for this study was required to fulfill detailed stipulated ethical considerations by the University's Ethics Committee prior to commencement and during the research process, there were particular ethical issues that the researcher was constantly aware of and reflected on. First, the researcher appreciated that values are inherent in the research process (McKenzie, 2001, p. 1). The selection of the topic for research, the questions asked, the chosen methodology and the discussion of social justice issues, are all illustrative of this point in the current study. Furthermore, the choice of research methods that fostered co-operative learning was strongly influenced by Montessori values like respect for others and encouraging a love of learning.

Second, it is acknowledged that the researcher is very much 'in' the research. What is meant here is that the research is a product of my world view, my choices, actions, interactions and interpretations of others' words and actions. Thus I needed to continually reflect on my biases, include a comprehensive audit trail, be open to unintended effects of the research on the participants and myself, as well as consider the nature of 'participation' in action research (Tripp, 1999, 2001).

The notion of 'participation' in action research is complex. There are various views and uses of this term in action research (Dick, 2000; Hart & Bond, 1995; Pretty, 1994). One leader in the action research field views some kind of participation definitional of this type of research (Kemmis & McTaggart, 2000). However, this then leaves open the question of how much and what kind of participation is needed in action research. Four broad categories of 'participation' have been distinguished by Tripp (2001, p. 5): compulsion, co-option, co-operation and collaboration (see Chapter 2). These categories are not seen as having clear boundaries since relationships between participants vary continuously throughout a project. The important point of this discussion is for the researcher to acknowledge the complexities of 'participation' and to document the ebb and flow of this phenomenon in the research.

In the context of these values and ethics in action research, the researcher adopted the theoretical perspective of the postmodern research paradigm (Denzin & Lincoln, 2000a, 2000b; Dobozy, 1999, 2002, 2004; Lather, 1991a, 1991b; Scheurich, 1997). This paradigm views the researcher as part of the research process and placed the researcher in a similar power structure to that experienced by the other participants. This meant an open and honest relationship between the researcher and the other participants, with all participants valued and respected. Hence the research findings, in draft format, were made available to teachers and other members of the school community, for comment.

3.5 Data Analysis

Change of Perceptions and Provision

1. Teacher Attitude Scale

The Gagné & Nadeau attitude scale (Gagné, 1991) was administered to the teachers. Pre-test (Term 4, 2002) and post-test (Term 4, 2003) medians and means were calculated and graphed on the following factors from the attitude scale, to determine effect size:

- Needs of gifted and support for services.
- Objections based on ideology and priorities.
- Social usefulness of gifted persons.
- Rejection of gifted persons.
- Ability grouping.
- Acceleration.
- Global scores.

Although data was only collected from twelve teachers, potential significant differences were investigated. For the related samples the Wilcoxon Signed Ranks test using SPSS was employed, which compared pre-test and post-test medians. Furthermore, the research means were compared with the means obtained from other Australian studies (S. M. Cooper, 1999; Gross, 1997) which also employed the Gagné & Nadeau scale.

2. Teacher Interviews

In the interview schedules, the type of evidence sought included teacher-reported changes in attitude, identification of gifted/learning difficulties children and modifications to students' programs.

3. Teacher Concept Mapping

The teachers' concept maps were analysed by conducting pre-test (Term 4, 2002) and post-test (Term 4, 2003) word counts and semantic network analysis,

particularly in terms of complexity. Evidence for changes in degree of teacher-documented knowledge about giftedness was sought.

4. Classroom Observations

The classroom observations of two (of the six) selected children, provided evidence, in the form of fieldnotes, that related to the types of educational programs these gifted students were involved in, the degree of engagement in their work, their writing behaviour, and other relevant issues.

5. Informal Observations

Teachers' feedback during the professional development sessions, staff meetings and staff sharing of programs and resources were informally observed and written up as fieldnotes in the Reflective Journal. Data gathered from these sources were analysed to determine patterns, develop and refine coding categories, select and emphasise themes or issues. Here evidence for actual changes in teacher practice, as distinct from teacher-reported changes, was the focus of investigation.

Informal observations of the six selected students and their parents were recorded. These types of observations arose during, for example, casual discussions with students, or feedback from parents at the Parent Education sessions. In the latter instance, for example, evidence was sought on reported changes in attitude regarding their children's engagement in schoolwork, programs and behaviour.

6. Records Search

School documents were examined to determine if changes were made in, for instance, policies, procedures, assessment results, availability of resources and classroom provision.

7. Reflective Journal

Throughout the study a reflective journal was kept, recording reflections on all sources of data and findings. These reflections also considered alternative interpretations of data, as well as an avenue to develop assertions or generalisations about changes in teachers' perceptions and provision for the gifted.

Outcomes for Teachers and Gifted Children

1. Observations

Evidence indicating outcomes for teachers was sought, including changes to the identification of twice-exceptional children, provision for the gifted and classroom behaviour. Evidence relating to outcomes for the children was also sought, such as, length of time the student was absorbed in an activity and perseverance when confronted with a difficulty in performing a task. Information relating to gifted children's outcomes (academic, social-emotional), arising from possible modifications to their educational programs, was also collected.

2. Document Searches

School procedural and policy documents were examined to ascertain changes relating to gifted education. The standardised literacy assessments of the students were quantitatively analysed to determine gains in spelling and writing ages during the study period. Significance of literacy gains was assessed. Gains in months over the study period were compared in a table, with gains in the previous year.

3. Reflective Journal

All sources of data, in terms of academic and behavioural outcomes, as well as considering other interpretations of the evidence obtained, were included in the reflective journal.

3.6 Reliability and Validity Issues in this Study

Reliability was enhanced in the present study by the use of various techniques. These techniques included the use triangulation, outlining theoretical and contextual assumptions, as well as describing the audit trail of how data were collected and decisions reached.

Construct validity was increased in this research by using multiple sources of evidence, establishing a chain of evidence and having key participants review data analyses. Internal validity was enhanced in the present study by applying a range of

strategies. These strategies involved the use of triangulation, conducting member checks, doing long term observations, involving the participants in all phases of the research, and finally, the researcher's own reflective journal to clarify ideas and biases. External validity was increased in the current research process by describing the typicality of the program and/or individual so that others could compare this with their own context, and by using several students to maximize the diversity of the phenomenon being studied.

Thus it can be seen that there were many strategies in common that were employed, to enhance reliability and validity in the present research. However, consideration of reliability and validity issues in action research needs also to be seen in the context of whether the stakeholders became involved and actively participated in the study as it progressed (Greenwood & Levin, 2000, p. 96). So, in the current research, it was important to discover if there was a change in the understandings of the staff regarding gifted education and if this was reflected in improved provision for gifted students in the school.

3.7 Limitations of Action Research

There are some limitations of action research as a research method. In broad terms these include reliance on subjective judgements, high risk of bias because evaluation of one's own efforts are involved and the findings are generally applicable only to the setting where the research was undertaken (Kemmis & McTaggart, 2000, p. 568; J. Webb, 2000, p. 19). However, these shortcomings can be minimised by the use of triangulation. Triangulation involved the collection of data from a variety of sources, settings, time frames, research methods and theoretical perspectives, which were independent of one another (Cherry, 1999, p. 62; Patton, 1990, p.464; J. Webb, 2000, p.19). This approach attempted to maximise both the internal validity of the process and generalisability. Other techniques that aimed at minimising the shortcomings of action research involved using cyclical processes which encouraged the researcher to continually test her ideas in action, asking colleagues for critical and supportive feedback, employing member checks, and lastly, working 'robustly'

with an awareness of researcher subjectivity by employing reflective techniques and co-operative inquiry (Cherry, 1999, p. 79; J. Webb, 2000, p. 19).

Table 3-4 outlines the limitations of the techniques to be used in this study, drawing on information presented by numerous authors on the weaknesses of various types of evidence collection (Denzin & Lincoln, 2000a; Merriam, 1998; Yin, 1994).

Table 3-3

Limitations of the Research Techniques Used in the Present Study

Technique	Limitations
Documents Search	<ul style="list-style-type: none"> • Subjectivity of teachers in student reports.
Attitude Scale	<ul style="list-style-type: none"> • Only twelve teachers in the school.
Interviews	<ul style="list-style-type: none"> • Response bias e.g. interviewee (teacher) tells interviewer what s/he thinks is expected. • Inaccuracies because of poor interviewee recall.
Observations	<ul style="list-style-type: none"> • Participants may behave differently because they were being observed. • Bias arising from my input in the role as Support Teacher at the school, particularly because I personally work with all of the gifted students with learning difficulties in literacy.

Nevertheless, since the design of the study utilised triangulation and the other techniques to enhance reliability and validity discussed above, the effects of these limitations should be minimised.

3.8 Summary

The topic of teaching gifted children was embraced because there was a recognised need within the school and the researcher wanted to investigate how to better support classroom teachers and the gifted children in those classes. The methodology of the research, a case study of a school involved in action research, was chosen because it was compatible with the culture, values and administrative procedures of the particular Montessori school participating in the research.

Furthermore, action research was the chosen research method because this method has been shown to increase participants' understandings, solve problems, facilitate change and produce positive outcomes. The strengths of action research, limitations and ethical considerations, as they applied in this study were examined, along with an analysis of the requirements to enhance reliability and validity, thereby providing informed support for the methodology chosen. The specific research techniques employed during the action research in the current study, which included the use of an attitude scale, interviews, observation and a research journal, were also reviewed.

Based on the literature review and the chosen methodology, the researcher had some expectations regarding the outcomes of this research. As Gross' (1997) Australian study involving in-service in gifted education found, it was expected that the staff would manifest heightened awareness of issues related to gifted education at the end of the project. However, there was also the possibility that Montessori teachers already had this heightened awareness because of their training. Alternatively, the design of the study, with the range of research techniques employed, could facilitate the revelation of different perspectives and understandings altogether. The researcher appreciated that the re-application of the Gagné & Nadeau attitude scale (Gagné, 1991) may or may not confirm previous Australian findings (S. M. Cooper, 1999; Gross, 1997). Furthermore, it was expected that some of the models and programs outlined in the literature review, and subsequently examined by the staff during the professional development, could lead to improved curriculum differentiation and provision for gifted students in the school. In general, an overall action research cycle, as illustrated in Figure 3-1, was envisaged, with positive changes and outcomes for all stakeholders ... and what actually ensued is reported in the following chapter.

CHAPTER 4

ANALYSES OF THE DATA AND FINDINGS

The outcomes of the analyses of data are presented in four sections: The first section is the analysis of the attitude scale investigating teachers' attitudes toward the gifted, utilising pre-test and post-test medians and means. The second section considers data obtained from the teacher interviews. Pre- and post-interview responses were compared to determine teacher-reported changes in attitude, identification of gifted/learning difficulties children and provision for these students. The third section presents data gathered from a range of sources: field notes, observations and documents, that elucidate rich data, over time, regarding provision for the gifted in the classroom context. The fourth section examines qualitative and quantitative data, also from various sources, including anecdotal feedback, classroom observations and standardised assessments, that indicate outcomes experienced by gifted students. Again, pre- and post-test outcomes were compared to ascertain literacy gains during the study period. Outcomes for teachers are also presented. A brief summary of the main findings concludes the chapter.

4.1 Analysis of Attitude Scale Data

All twelve teachers at the school completed the scale "Opinions about the gifted and their education" (Gagné, 1991). This scale was administered twice: once at the beginning of the research, prior to the presentation of the professional development on gifted education, and then at the end of the research, after the professional development and ongoing provision of resources and curriculum support, to determine if there were any changes in attitudes toward the gifted and their education.

Teachers' Attitudes Before Professional Development

For all factors of the attitude scale the teachers' responses on individual items were widely spread. (Refer to Instruments in Chapter 3 for a detailed description of

the factors and Appendix 11 for frequency data). The spread was over five attitude categories, from totally agree to totally disagree, except for Factor D that was over four attitude categories. This showed that teachers' responses on individual items for the different factors covered the whole range of views about the education of the gifted. Overall however, for the total score on all the factors, one teacher indicated negative attitudes, five were ambivalent and five were positive, while one teacher expressed very positive attitudes towards the gifted.

Table 4-1 displays the descriptive statistics for the teachers' responses on the different factors before professional development. The total score indicates teachers had a positive attitude toward gifted children and their needs. The results for each factor are discussed below.

Table 4-1

Descriptive Statistics for Pre-test Teacher Responses to Scale Items (n = 12)

Factor	Range	Minimum	Maximum	Mean	Standard deviation	Median
A: Needs	1.63	3.00	4.63	3.7917	0.45017	3.8125
B: Opposition	3.10	1.90	5.00	3.5750	0.82696	3.5000
C: Social value	2.00	2.59	4.50	3.6458	0.62576	3.7500
D: Rejection	2.00	1.67	3.67	2.7778	0.64092	3.0000
E: Grouping	2.99	1.50	3.50	2.4375	0.58509	2.5000
F: Acceleration	2.00	2.20	4.20	3.2667	0.65134	3.1000
Total				3.3848	0.45590	3.2647

For Factor A, the needs of gifted children and support for special services, teachers' attitudes ranged from very negative to very positive on individual items for this factor. For example, two teachers indicated negative attitudes on four of the eight Factor A items, while eight teachers indicated positive attitudes on six of the Factor A items. All the teachers indicated positive attitudes for Factor A Item 30, which stated "Since we invest supplementary funds for children with difficulties, we should do the same for the gifted" (Gagné, 1991). (See Appendix 11 for teacher responses on individual items.) Overall for this factor, however, ten teachers indicated positive attitudes toward special provision for the gifted.

Factor B, opposition to the gifted based on ideology and priorities, again showed a wide spread of teacher responses for individual items, namely from very

negative to very positive attitudes. One teacher indicated very negative attitudes on six of the ten Factor B items, while six teachers indicated negative attitudes on three or more Factor B items. Most responses, however, were in the positive to very positive range. For instance, seven teachers indicated positive attitudes for at least three Factor B items and four teachers indicated very positive attitudes on five or more Factor B items. Overall for this factor, nine teachers expressed positive attitudes toward ideologies and priorities for the gifted.

Factor C related to the social value of the gifted. Teacher responses on individual items showed a wide spread of attitudes from very negative to very positive. Three teachers indicated very negative attitudes on two of the four Factor C items, while ten indicated very positive attitudes on at least one of the Factor C items. For Item 13, which states "Gifted persons are a valuable resource for our society" (Gagné, 1991), eleven of the teachers expressed positive attitudes. Overall the majority of responses reflected positive to very positive attitudes. That is, eight teachers held views that acknowledged that the gifted of today are perhaps the leaders of tomorrow and that they are a valuable societal resource.

Factor D investigated the rejection of the gifted by other students and teachers. It examined the envy of others in the immediate environment toward the gifted. Responses in this study showed that the teacher attitudes ranged from very negative to positive on the three individual Factor D items. For this factor, the same number of teachers indicated negative attitudes as expressed positive attitudes, resulting in an overall ambivalent attitude. The teachers with negative attitudes indicated that they did not support the attitude that gifted children had more difficulty in making friends, that some teachers felt their authority threatened by gifted children and/or that the gifted were rejected because others were envious of them. Conversely, teachers with positive attitudes for this factor considered that the gifted did experience such rejection.

Factor E, the attitude toward the ability grouping of students, was overall at the negative end of responses, although attitudes ranged from very negative to very positive on individual items. Seven teachers indicated very negative attitudes on at least one of the four Factor E items and nine gave negative responses on at least one Factor E item. Only one teacher indicated a very positive attitude on one of the Factor E items. Overall for this factor, eight teachers indicated negative attitudes,

three were ambivalent and one expressed positive attitudes. The generally negative response to this factor indicated that teachers did not see the value of separating gifted students from the rest of the class and they did not support placing the gifted in special classes as a means to having their needs met.

Factor F examined attitudinal responses toward the effects of acceleration. Overall for this factor, seven teachers reflected ambivalent attitudes, four were positive and one expressed negative attitudes. This indicated that, in general, teachers' attitudes about the use of acceleration as a method of catering for gifted students tended towards the more positive end of the scale.

The total score mean indicated that, overall, the teachers expressed positive attitudes toward the gifted at the beginning of the research.

Teachers Attitudes After Professional Development and Support

The same twelve teachers completed the second attitude scale at the end of the research, during the last term of the school year. Table 4-2 presents the descriptive statistics for the teachers' responses on the different factors after professional development and support throughout the year. The total score indicates that the teachers continued to have a positive attitude toward gifted children and their needs. The spread of teachers' responses on individual items and results for each factor are discussed below.

Table 4-2**Descriptive Statistics for Post-test Teacher Responses to Scale Items (n = 12)**

Factor	Range	Minimum	Maximum	Mean	Standard deviation	Median
A: Needs	1.63	3.25	4.88	3.9375	0.48118	4.0000
B: Opposition	3.10	1.90	5.00	3.5750	0.82696	3.5000
C: Social value	2.25	2.00	4.25	3.4375	0.62272	3.7500
D: Rejection	1.33	2.00	3.33	2.6667	0.44947	2.8333
E: Grouping	2.75	1.25	4.00	2.2500	0.84611	2.1250
F: Acceleration	1.80	1.80	3.60	2.9333	0.55487	3.0000
Total				3.3260	0.39229	3.4118

As was seen in the initial attitude scale, the teachers' responses on individual items were widely spread for all factors. (Refer to Appendix 11 for frequency data.) Again the spread was over five attitude categories, except for Factor D which was over four attitude categories. This shows that teachers continued to have responses on individual items, for the different factors, that covered the whole range of views about the education of the gifted. Overall however, for the total score on all the factors, after professional development and support throughout the year, one teacher indicated negative attitudes, three were ambivalent and eight expressed positive attitudes toward the gifted. Compared to the total scores for the initial scale, seven of the twelve teachers' attitude categories remained unchanged for the total scores on the second scale. Two teachers shifted from the ambivalent to the positive category and one from the negative to the ambivalent category for total scores, over this time period. The remaining two teachers, changed to less positive attitude categories; one from the very positive to positive category, although the second scale total score was on the upper limit of the positive category, and the other from the ambivalent to the negative category.

For Factor A, referring to the needs of gifted children and support for special services, teachers' attitudes continued to range from very negative to very positive on individual items for this factor. However, for Item 1, which states "Our schools should offer special education services for the gifted" and for Item 30, "Since we invest supplementary funds for children with difficulties, we should do the same for the gifted" (Gagné, 1991), all the teachers indicated a positive attitude. Eleven

teachers agreed with Item 15, "The gifted need special attention in order to fully develop their talents" (Gagné, 1991). Overall for this factor, five teachers indicated a positive attitude and five a very positive attitude toward special provision for the gifted, compared to seven teachers who indicated positive attitudes and three very positive attitudes in the initial administration of the scale. This shows an attitude category shift for two teachers, over the study period, from the positive to the very positive category.

Factor B, opposition to the gifted based on ideology and priorities, again showed the widest possible spread of teacher responses for individual items, namely from very negative to very positive attitudes, with the majority of responses being positive. As was found in the initial administration of the scale, overall for this factor, five teachers indicated positive attitudes and four expressed very positive attitudes towards ideologies and priorities for the gifted. So, overall for Factor B, at the end of the research the teachers indicated no attitude change, with most expressing positive attitudes to the gifted based on ideology and priorities.

Factor C, the social value of the gifted, had a spread of responses on individual items from very negative to very positive, with the highest frequency of responses in the ambivalent category. For Item 13, which states "Gifted persons are a valuable resource for our society" (Gagné, 1991), the teachers were again in general agreement, with ten of them expressing positive attitudes. However, considering the total score on this factor, nine of the teachers reflected positive to very positive attitudes. That is, at the second administration of the scale, one additional teacher indicated views that acknowledged that the gifted of today are perhaps the leaders of tomorrow and that they are a valuable societal resource.

Factor D related to the rejection of the gifted by other students and teachers, and examined the envy of others in the immediate environment toward the gifted. Overall responses for this factor showed that teacher attitudes ranged from negative to positive, with six teachers indicating negative attitudes, five ambivalent attitudes and one positive. This indicated a slight shift in attitudes to the more negative end of the scale, where teachers did not support the attitude that gifted children had more difficulty in making friends, that some teachers felt their authority threatened by gifted children and that the gifted were rejected because others were envious of them.

Factor E, the attitude toward the ability grouping of students, was overall at the negative end of responses, although attitudes ranged from very negative to very positive on individual items for this factor. Overall for this factor, eight teachers indicated negative attitudes, three were ambivalent and one expressed positive attitudes, as was found for teacher responses in the initial scale. That is, the same generally negative response to this factor was obtained. Teachers did not see the value of separating gifted students from the rest of the class and they did not support placing the gifted in special classes as a means to having their needs met.

Factor F examined attitudinal responses toward the effects of acceleration. Teacher responses ranged from very negative to very positive on individual items for this factor, with the majority of individual responses in the negative categories. Overall for the factor, six teachers reflected ambivalent attitudes, three were positive and three expressed negative attitudes. This result indicated a slight shift in attitude toward the use of acceleration as a method of catering for gifted students, to an overall less positive attitude than initially expressed.

The total score mean indicated that at the end of the research, the teachers had maintained their positive attitudes toward the gifted, as expressed initially. So, overall, an analysis of the frequency of teacher responses on the attitude scale and the total scores showed the teachers' attitudes toward the gifted basically remained the same during the study period. Even so, for some factors, A, C, D and F, slight changes in attitude were observed. The overall data for factors A and C suggested a move to the more positive end of the scale, while data for factors D and F indicated a shift to the more negative end of the scale. The following section will examine these findings in detail to determine if these changes were significant.

Medians of Montessori Teacher Responses

Medians of Teacher Responses Before Professional Development

Medians were calculated in this study because of the spread of responses on each item and the small sample size. See Tables 4-1, 4-2 and 4-3. The medians of the responses of the teachers, shown in Figure 4-1, indicate positive attitudes for factors relating to Needs, Opposition and Social Value (A, B and C), ambivalent

attitudes for Rejection and Acceleration (D and F) and a negative attitude toward Grouping (E). The overall total score was in the positive range of attitudes.

Medians of Teacher Responses After Professional Development and Support

The medians are in the same attitude categories after professional development and support, as was found initially. Refer to Figure 4-1 for the medians of teachers' responses on the attitude scale. This graph suggests there was minimal change in teacher attitude over the study period.

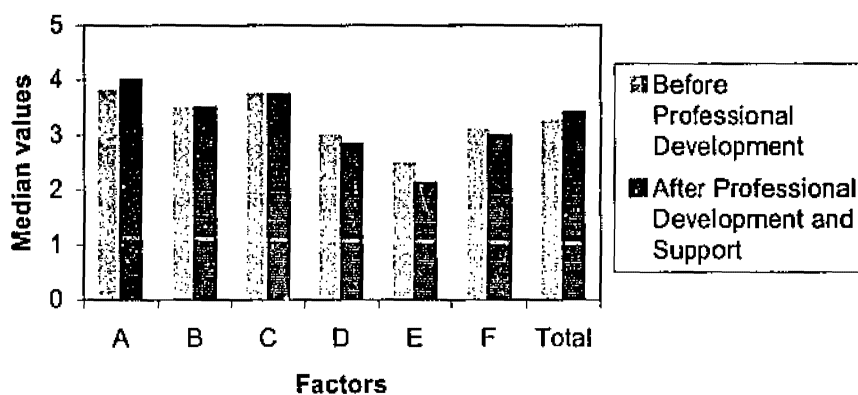


Figure 4-1. Pre- and post-test medians of teachers' responses on the attitude scale

Due to the small sample size, medians were calculated to perform tests of significance. For the related samples, the Wilcoxon Signed Ranks test using SPSS was employed, comparing pre- and post-tests. A sign change was found for Factor F, Acceleration, with $Z = -2.375$, $p < 0.05$. This indicated a shift to a less favourable attitude towards acceleration. No other significant results were obtained, (see Table 4-3). This means that for nearly all factors the teachers' attitudes did not change significantly during the study. The result for Factor F was unexpected, given the common use, over many years, of this strategy for gifted children in the school. Thus follow-up investigation of this finding was indicated and conducted using Member Checks (see Chapter 4.5).

Table 4-3**Wilcoxon Signed Ranks Test for Significance (n = 12)**

Factor		Mean rank	Sum of ranks	Z	Asymp. Sig. (2-tailed)
A: Needs					
Term 1	+	5.42	32.50	-0.512 ^a	0.609
Term 4	-	5.63	22.50		
B: Opposition					
Term 1	+	0.00	00.00	-0.512 ^b	1.000
Term 4	-	0.00	00.00		
C: Social value					
Term 1	+	3.50	10.50	-1.776 ^c	0.076
Term 4	-	6.36	44.50		
D: Rejection					
Term 1	+	3.90	19.50	-0.360 ^c	0.719
Term 4	-	6.38	25.50		
E: Grouping					
Term 1	+	4.88	19.50	-1.204 ^c	0.228
Term 4	-	6.64	46.50		
F: Acceleration					
Term 1	+	2.25	04.50	-2.375 ^c	0.018
Term 4	-	6.31	50.50		
Total					
Term 1	+	4.00	16.00	-1.174 ^c	0.241
Term 4	-	6.50	39.00		

Key:

a = Based on negative ranks

b = Sum of negative ranks equals the sum of positive ranks

c = Based on positive ranks

Montessori Teacher Responses Compared With Other Contexts

To enable comparison with other studies, means of the Montessori teachers' responses were also calculated. Refer to Tables 4-1 and 4-2 for the means data.

Means of Montessori Teacher Responses Before Professional

Development and Support

For the interpretation of responses to the attitude scale Gagné (1991) recommended using the means because of their direct relationship with the Likert scale descriptors. However, caution is required in the application of means in this study because of the wide spread of responses and small sample size. The pre-test (before professional development) means indicate that the teachers had positive attitudes for factors relating to Needs, Opposition, Social Value and Acceleration (Factors A, B, C and F), as well as for the overall total score attitude. The teachers had an ambivalent attitude about the isolation of gifted persons by others in their immediate environment (Factor D) and a negative attitude towards ability grouping of students (Factor E), (refer to Figure 4-2).

Means of Montessori Teacher Responses After Professional Development and Support

The post-test (after professional development and support) means of the teachers' responses reveal positive attitudes for factors relating to Needs, Opposition, Social Value (Factors A, B and C) and the overall total score, which is the same as initially found. The mean for Acceleration (Factor F) had changed to the ambivalent attitude category, from the positive category. Similarly, the mean for Rejection (Factor D) of the gifted changed from an ambivalent to negative attitude. The negative attitude toward ability grouping of students (Factor E) remained unchanged. The means of teachers' responses on the attitude scale after professional development and support are also shown in Figure 4-2. This graph suggests there has been some small changes in attitude.

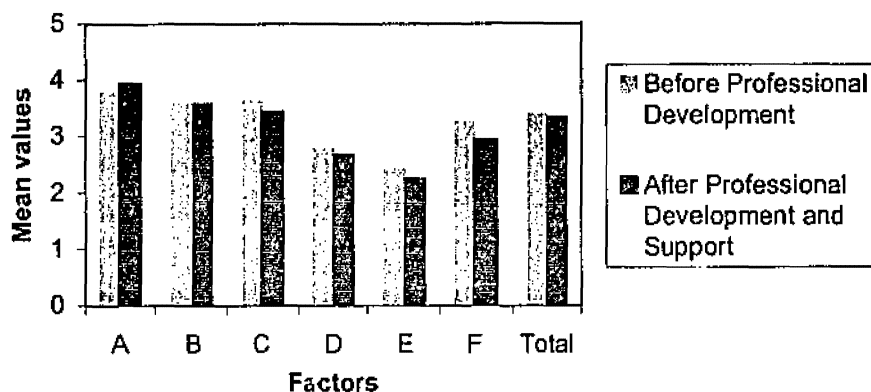


Figure 4-2. Pre- and post-test means of teachers' responses on the attitude scale

Means of Montessori Teachers Compared with Other Contexts

Both pre- and post-test means, for all factors, obtained for the Montessori teachers were lower than the means for New South Wales primary and secondary teachers studied by Gross (1997), as shown in Table 4-4. This is particularly noticeable in the Needs, Rejection and Ability Grouping (A, D and E) factors where the Montessori teachers are an attitude grouping below the other teachers' groupings.

Table 4-4**Means of Teacher Attitude Scale Responses: Comparison with Gross (1997)**

Factors	Prof. Develop.	Montessori	Gross (1997) GN	Gross (1997) GS	Gross (1997) GC
A:	Before	3.79	4.07	4.08	4.59
Needs	After	3.93		4.39	4.74
B:	Before	3.58	3.59	3.69	4.13
Opposition	After	3.58		3.91	4.57
C:	Before	3.65	3.72	3.72	4.04
Social Value	After	3.44		3.85	4.31
D:	Before	2.78	3.37	3.45	3.83
Rejection	After	2.67		3.56	4.04
E: Ability	Before	2.43	3.00	2.97	3.61
Grouping	After	2.25		3.54	4.35
F:	Before	3.27	3.29	3.37	3.96
Acceleration	After	2.93		3.83	4.62
Total score:	Before	3.39	3.59	3.63	4.12
Sum of A to F	After	3.33		3.93	4.51
Key: GN = Gross (1997) Teachers Not Engaged in Gifted Ed. Study (N = 147)					
GS = Gross (1997) Single Day Inservice (N = 78)					
GC = Gross (1997) GOCE Post-graduate Course (N = 70)					

The means for all factors obtained for the Montessori teachers can also be compared with a Western Australian study of university secondary teachers' attitudes toward the gifted, conducted by Cooper (1999). As presented in Table 4-5, the Montessori teachers had more positive attitudes, overall, both pre- and post-test, than the university secondary teachers after they too had participated in gifted education modules. However, this observation must be treated with caution because of the possible differences in attitudes of primary and secondary teachers, rather than differences between Montessori and non-Montessori teachers.

Table 4-5**Means of Teacher Attitude Scale Responses: Comparison with Cooper (1999)**

Factors	Prof. Develop.	Montessori	Cooper (1999) '96	Cooper (1999) '97	Cooper (1999) '98
A:	Before	3.79	3.83	3.53	
Needs	After	3.93		3.02	3.62
B:	Before	3.58	3.32	2.98	
Opposition	After	3.58		2.46	3.24
C:	Before	3.65	3.44	3.18	
Social Value	After	3.44		2.75	3.37
D:	Before	2.78	3.01	2.99	
Rejection	After	2.67		2.48	2.56
E: Ability	Before	2.43	2.80	2.46	
Grouping	After	2.25		2.07	2.91
F:	Before	3.27	3.09	2.77	
Acceleration	After	2.93		2.34	3.08
Total score:	Before	3.39	3.33	3.03	
Sum of A to F	After	3.33		2.52	3.22

Key: '96 = Cooper (1999) University Secondary Teachers in 1996 (N = 108)
 '97 = Cooper (1999) University Secondary Teachers in 1997
 (Before course N = 63; After course N = 58)
 '98 = Cooper (1999) Graduate Secondary Teachers in 1998 (N = 17)

Teacher Comments on the Attitude Scale**Before Professional Development**

Most of the teachers spontaneously made comments about the attitude scale as they completed it. These comments were either written by the teachers themselves, next to the relevant items, or recorded by the researcher as the items were completed. There were three main categories of comments: first, those that could be interpreted as statements of support for Montessori educational philosophy; second, those that related to the wording of some items; and third, comments concerned with the teachers' conceptions of giftedness. With reference to the first

category, some comments about Items 2, 8, 14 and 34 for instance, can be interpreted as statements of support for Montessori educational philosophy (see Table 4-6 for teacher quotes).

Table 4-6

Teachers' Pre-test Comments Related to Support for Montessori Educational Philosophy (Attitude Scale)

Scale item	Comment
2. The best way to meet the needs of the gifted is to put them in special classes.	"We meet their needs through special programs rather than special classes."
8. It is more damaging for a gifted child to waste time in class than to adapt to skipping a grade.	"We don't have single grade classes - this overcomes some difficulties."
14. The special education needs of the gifted are too often ignored in our schools.	"Normal part of our approach to cater for the education needs of the gifted."
24. In order to progress, a society must develop the talents of individuals to a maximum.	"Up to the child! In Montessori we emphasize 'independent learning'."
34. A greater number of gifted children should be allowed to skip a grade.	"No, because Montessori MAG classes meet the needs of gifted children and they can already skip classes."

The second category of comments made about the attitude scale involved the wording of items. Some teachers considered that the wording sometimes appeared to be inappropriate in the Montessori context, as in Items 20, 23, 32 and the "After finishing" comments (as illustrated in Table 4-7).

Table 4-7

Teachers' Pre-test Comments Related to Inappropriate Wording of Items for Montessori Context (Attitude Scale)

Scale item	Comment
20. Gifted children should be left in regular classes, since they serve as an intellectual stimulant for the other children.	"Gifted children are perhaps better catered for in a regular class, meaning a regular Montessori MAG class, but only if their intellectual and social needs are being met in that class. Certainly they shouldn't be in the class for other children's benefit."
23. The gifted are already favoured in our schools.	"'Our' means Montessori school; no one is favoured above another - all children are favoured."
32. The regular school program stifles the intellectual curiosity of gifted children.	"'Regular school program' is meaningless in a Montessori context. Our school has MAG classes so the intellectual needs of the children are being met."
After finishing the scale	<p>"The word 'school' in the Scale implies standard single grade classes, so the questions are somewhat out of context in our situation."</p> <p>"Some of the statements in this Attitude Scale don't make much sense from the Montessori perspective. They assume single grade classes and a narrow view of giftedness."</p>

The third category of comments related to conceptions of giftedness, where the Montessori teachers believed that traditional gifted programs only focused on academic subjects rather than the multiple intelligences. For instance, teachers made comments about Items 4, 21, 24, 33 as well as the "After finishing" comments (refer to Table 4-8 for teacher quotes).

Table 4-8**Teachers' Pre-test Comments Related to Conception of Giftedness (Attitude Scale)**

Scale item	Comment
4. Special programs for gifted children have the drawback of creating elitism.	"Elitism is not necessarily a bad thing. It is in Montessori too." "Not all areas of giftedness are addressed." "Only if the school culture allows it. It can be prevented."
21. By separating students into gifted and other groups, we increase the labelling of children as strong-weak, good-less good.	"If all giftedness areas are identified."
24. In order to progress, a society must develop the talents of individuals to a maximum.	"Develop talents of all gifted, not just maths and language gifts."
33. The leaders of tomorrow's society will come mostly from the gifted of today.	"Sometimes giftedness isn't recognised in children, thus someone who appears gifted in later life may not have been identified as such at school." "Importance of multiple gifts."
After finishing the scale	"This Attitude Scale is very difficult to complete because Montessori views giftedness in a different way, that is, not just academic subjects."

After Professional Development and Support

The second administration of the attitude scale again elicited spontaneous comments, although not as many as for the initial presentation. The comments could be grouped into the same three categories identified previously. Representative examples of these comments are presented here. There were statements of support for the Montessori educational philosophy (see Table 4-9).

Table 4-9**Teachers' Post-test Comments Related to Support for Montessori Educational Philosophy (Attitude Scale)**

Scale item	Comment
2. The best way to meet the needs of the gifted is to put them in special classes.	"No, but gather them sometimes for special projects".
11. The gifted waste their time in regular classes.	"Only if their needs are not being met."
14. The special education needs of the gifted are too often ignored in our schools.	"Some schools."
16. Our schools are already adequate in meeting the needs of the gifted.	"Relying on the expertise of the teacher."

Some teachers again queried the wording of a few of the items, stating it seemed inappropriate for the Montessori context. These comments were similar to those presented in Table 4-7. Teacher comments during the second administration of the attitude scale also related to their conceptions of giftedness (refer to Table 4-10).

Table 4-10**Teachers' Post-test Comments Related to Conception of Giftedness
(Attitude Scale)**

Scale item	Comment
1. Our schools should offer special educational services for the gifted.	"For ALL children."
4. Special programs for gifted children have the drawback of creating elitism.	"Only if the school allows this to happen."
18. It is parents who have the major responsibility for helping gifted children develop their talents.	"Parents and educators together."
25. By offering special educational services to the gifted we prepare the future members of a dominant class.	"It is part of our education to give virtues/values of democracy, helpfulness, etc."
28. Gifted children might become vain or egotistical if they are given special attention.	"Then it is the wrong attention."
34. A greater number of gifted children should be allowed to skip a grade.	"If appropriate for that child."

Summary of Attitude Scale Data

Montessori teachers' attitudes toward the gifted were analysed using the attitude scale, "Opinions about the gifted and their education" (Gagné, 1991). No significant differences between their attitudes before professional development and after professional development were found, except for Factor F. The medians of the responses of the Montessori teachers revealed positive attitudes for factors relating to Needs, Opposition and Social Value (A, B and C), ambivalent attitudes for Rejection and Acceleration (D and F) and a negative attitude toward Grouping (E). The overall score was in the positive range of attitudes.

The Montessori teachers' means on this scale were compared with other Australian studies. A comparison of the New South Wales teachers in Gross' (1997) study with the Western Australian Montessori teachers, revealed that the latter group expressed less favourable attitudes toward the gifted. However, when the Montessori teachers were compared with other teachers from their own state, the Montessori teachers recorded higher means, that is, more positive attitudes toward the gifted.

4.2 Analysis of Teacher Interview Data

All nine class teachers at the school completed the researcher-designed interview schedule. Specialist teachers did not participate in the interviews (see Chapter 3). The interview schedule was administered twice, initially, prior to the staff presentation of professional development on gifted education (Appendix 3), and subsequently, after the professional development session and four school terms of ongoing resources and curriculum support (Appendix 4).

Montessori Teacher Interview Responses Before Professional Development

The fourteen questions in the first teacher interview schedule have been logically grouped into seven topics of investigation and the results are analysed in the order that the questions were asked. Question 1 is dealt with alone and analyses teachers' concept maps of 'giftedness'. Questions 2, 3 and 4 are grouped together as they all relate to the identification of gifted children. Questions 5 and 6 refer to gifted underachievers, while questions 7 to 9 consider gifted students with learning difficulties. Teachers identified children by name, in response to questions 2-9, for ease and clarity of discussion, but the children's names are not stated in this thesis to ensure confidentiality. Classroom strategies are examined in questions 10 and 11, and policy issues are raised in questions 12 and 13. The final question is open-ended, for respondents to make any further comments.

Concept maps of 'giftedness'

Question 1: Using a concept map show your conception of 'giftedness'.

Teachers were asked to show their conception of giftedness by constructing a concept map. The concept maps were analysed by conducting word counts and semantic network analyses. To analyse the concept maps by word counts, only words containing four or more letters were included in the word count totals, so that teachers who only wrote key words were not overly disadvantaged (Ryan & Bernard, 2000, p. 769). The word count totals ranged from 11 to 118 words, with the majority of counts being below 53, except for one teacher's concept map that contained 118 words. See Figure 4-3 for a typical concept map.

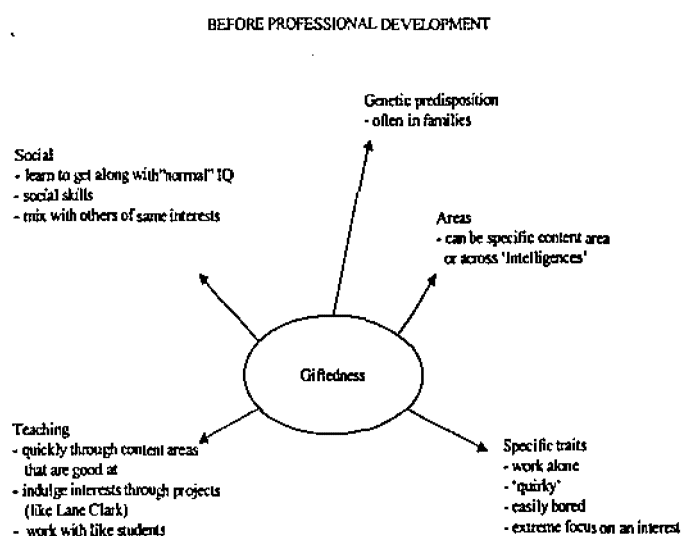


Figure 4-3. Typical concept map of teacher conception of 'giftedness'

The semantic network analysis of the teachers' concept maps of giftedness initially identified six core semantic areas: multiple intelligences, characteristics of the gifted, provision for the gifted, social issues, societal values, and the gifted as a sub-group of special needs. Eight of the nine teachers included the multiple intelligences conception of the gifted. Eight teachers mentioned the characteristics of the gifted in some way or another. Three teachers noted provision issues, while two mentioned social issues for the gifted. The remaining two core semantic areas, the impact of societal values (specifically, the negative attitude of Australian society toward the gifted) and the gifted as a sub-group of special needs, were only mentioned by one teacher.

From the core semantic areas, related semantic sub-concepts were then identified, and these sub-concepts were variously refined into increasing degrees of complexity. For example, one teacher identified the 'multiple intelligences' core semantic area, and from this a network of five branches was constructed: 'language', 'logico-mathematical', 'social', 'physical' and 'creativity'. The network drawn from the 'language' sub-concept was to 'communication', which then divided into 'written' and 'verbal' categories. This pattern of refining was continued for the other sub-concepts. Table 4-11 summarises the data from the semantic network analysis for all participants.

Table 4-11

Teachers' Pre-test Core Areas in Concept Maps of Giftedness

Core semantic areas identified	No. of teachers identifying core semantic area	No. of semantic sub-concepts of core area identified per teacher	No. of semantic sub-concept refinements per teacher
Multiple intelligences	8	1-10	1-3
Characteristics of the gifted	8	1-10	1-3
Provision for the gifted	3	2-6	1-2
Social issues	2	2	1
Societal values	1	3	1
Gifted as a sub-group of special needs	1	3	1

The concept maps of two teachers are reproduced in the section presenting the results of the second interview, where the before and after professional development concept maps, of the same teachers, can be compared (see Figures 4-4 and 4-5). The concept maps chosen for illustration were selected on the basis of maximum variation, one being the 11-word count and the other the 118-count.

Identification of gifted children

Question 2: *How many students in your class have been formally identified as gifted?*

Question 3: *How were these gifted students identified?*

Question 4: *Do you think there are any students in your class who are gifted but have not yet been formally identified?*

Three of the nine teachers stated they had one child in their class identified as gifted. In each case the child had been identified by a psychological assessment using the WISCIII or the WPSI (see Chapter 1), which can only be conducted by a psychologist. Furthermore, a teacher of one of these identified gifted students stated additional in-class identification criteria, including social awareness, justice issues and overall general knowledge. One of these three children was in a Children's House class (3-6 years old) and the other two were in junior primary MAG classes (6-9 years old).

All the teachers, except one, thought there were gifted children in their classes who had not been formally identified as gifted. They named between one and six children in their classes who they thought were gifted and also indicated their area/s of giftedness. The teacher who was the exception, teaches pre-primary children and considered 3 year old children to be too young for such identification.

Gifted underachievers

Question 5: *Do you think there are any gifted underachievers in your class?*

Question 6: *Who are your gifted underachievers in your class?*

One teacher was adamant that there were no gifted underachievers in that class, while all the other teachers identified one to four students as gifted underachievers.

Gifted students with learning difficulties

Question 7: *Do any of your gifted students also have learning difficulties?*

Question 8: *Who are your gifted students with learning difficulties?*

Question 9: *What specific difficulties do they have?*

Teacher responses varied widely on whether there were any gifted students with learning difficulties in their classes. One teacher indicated uncertainty about how to identify such students and thus whether or not there were any such students in the class. Another teacher said there were no gifted students with learning difficulties in the class, while all the other teachers identified one to five children in their classes as being in this category.

Classroom strategies

Question 10: *Tell me about what you do in your classroom for gifted children. Please explain in detail, for example, how often does (insert child's name) do (insert teachers' strategies/approaches)?*

Question 11: *Do you think these strategies/approaches work well?*

Teachers outlined a wide range of classroom strategies to cater for the needs of gifted children. These strategies may be grouped into five categories: teacher attitudes toward gifted students, type of tasks, grouping, acceleration, and staffing issues, as shown in Table 4-12. Representative examples of these strategies are given in the following quotes.

Table 4-12

Teachers' Pre-test Classroom Strategies Employed to Cater for the Needs of Gifted Children

Strategy category	Teacher stated classroom strategy
Teacher attitude toward student	"Expect excellence."
	"Encourage children to work out of their comfort zone."
	"Give as many opportunities as ... they want."
	"Give responsibility", "leadership role" for these students and "opportunities to share gifts".
Type of tasks	Use "thinking skills", "open-ended tasks" and "goal setting techniques".
	"Independent investigations" and "challenges".
	"Follow strengths and interests."
	Give "extension work" and "enrichment activities".
Grouping	"Peer tutoring."
	"Children grouped according to ability for particular lessons."
Acceleration	"Give work appropriate for older children."
	"Accelerate in areas of strength."
Staff	"More PD in area of student need."
	"Use of experts and other teachers in their areas of expertise."

Responses to Question 10 clearly indicate that teachers drew on a wide range of classroom strategies to support gifted students, but how well these strategies worked were queried in Question 11. All teachers felt these strategies worked well, some unequivocally, others with reservations. The two teachers who considered their classroom strategies worked unequivocally well made statements such as, "students flourish" and students have "every opportunity to progress at own level".

Seven teachers had reservations about the effectiveness of their classroom strategies in catering for the needs of gifted children in their classes. Their comments included:

- "Works well but not enough time for individual attention, [need] more help from parents, [need] own professional development, [need] mentors."
- "Can always do more. Would work better if applied consistently."
- "[Need to encourage] mutual regard for different gifts".
- "[Students happy to follow] own areas of interest, but bored with Montessori jobs".
- "Only if the child has the social skills and independence to utilise the opportunities available to them - some choose minimum and easy options."

Policy issues

Question 12: *How do you feel about the school's current approach to the gifted and talented?*

Question 13: *Do you think the school's current gifted and talented approach works?*

Responses to the policy questions ranged from positive expressions about the school's approach, to negative statements. Typical positive statements included:

- "I'm impressed that the school caters for learning difficulties and extension students. Best run administration and policies of all the Montessori schools I have worked in."
- "Because we are a Montessori school, and if we truly follow Montessori philosophy and curriculum we should be meeting their [the gifted children's] needs." "[Our] individual programs recognise giftedness in all areas."
- "Vertical MAG classes cater for this [the gifted child's needs]." "Better than other schools - we don't separate them [gifted children] as it is not good for them socially; we work one-on-one anyway; we are careful of

social needs; they can skip a grade and do accelerated work [in a subject area]."

Typical teacher statements indicating some reservations about the school's approach to the gifted were as follows:

- "The children are moving around all the time."
- "MAG classes are a better setting than children all at one level, if we use it well and if children work at their highest level. But sometimes we are not reaching out [to children in need] because there is little time."

Representative negative statements about the school's approach towards the gifted were:

- "[We] use short intensive bursts. Very difficult when children leave the class [for a maths challenge program]."
- "[We are] not catering for gifted children adequately" and "not doing enough." "[There is] not enough time."
- "[Classes with] multi levels in vertical groupings place huge demands on teachers."

When stating their reservations, some teachers suggested ways that the school's approach towards the gifted could be improved:

- "[Need] a whole school approach."
- "We need to use a far wider range of strategies for the gifted."
- "There is a lack of understanding by staff of gifted children's needs - we need professional development."
- "Need more time and support [to focus on gifted children]."
- What is "being done [for the gifted] is not acknowledged".

Other comments

Question 14: *Is there anything you would like to add regarding gifted education at the school, classroom provision for the gifted including those with learning difficulties, or anything else on this subject? Any comments?*

The final question in the interview was open-ended, inviting teachers to make additional comments about gifted education. Six of the nine teachers chose to contribute in this way, each making one to three different comments. Two teachers made positive statements. One was about the benefits of the Montessori educational setting over the traditional school system, while the other reflected that in "MAG

classes, all the kids are doing individual work, so their needs are being met". All the other comments were of a negative nature. These latter comments can be divided into three categories, on provision, social and staff issues.

Comments on the provision issue recognised that more needed to be done for the gifted in the school. For instance, one teacher said "students could be encouraged and supported to enter competitions in their areas of expertise".

Social issues were raised by three of the teachers. One teacher expressed concern about limited resources to support the special needs of other children in the school, particularly those with social and behavioural problems. Another teacher considered that it was important to "help children feel part of society but not feel superior". The emphasis was on gifted children being "... part of the class like all the other children". The third teacher took the position that giftedness was a social development issue, that it involved the "social acceptance of human differences". In this context this teacher said, "teachers need to be aware of [gifted children's] traits and socially what the children need, [and] allow the kids to get their own needs met".

The final category of negative comments related to pressure on staff to cater for all the children's individual needs. The statement, "Give teachers a break! [We] are expected to do so much ..." typifies this sentiment.

Interview Questions After Professional Development and Support

The second teacher interview schedule included the fourteen original questions from the first schedule. Questions 1-11 in the second interview schedule were identical to those in the first schedule, but slight wording variations were made to questions 12, 13 and the final question, to account for developments in the school since the initial interviews. In addition, the second interview schedule included seven new questions (see Appendix 4). These new questions were incorporated because the issues they investigated arose during the study as important factors impacting on provision for the gifted. It was deemed worthwhile to examine these factors in more detail, so that a clearer picture of the education and provision issues for the gifted could be ascertained.

The twenty-one questions in the second interview schedule were grouped into the same seven topics of investigation identified in the first schedule, with the

addition of one extra topic, teacher training. Question 1 again analyses teachers' concept maps of 'giftedness'. The second topic relates to the identification of gifted children (questions 2 - 4). The third topic refers to gifted underachievers (questions 5 and 6), followed by responses about gifted students with learning difficulties (questions 7 - 9). The fifth topic examines classroom strategies (questions 10 and 11). Sixth, policy issues are considered (questions 12 - 15). This is followed by the seventh topic, teacher training questions (16 - 20). The interview is concluded by an open-ended question (21) inviting respondents to add further comments.

Montessori Teacher Interview Responses After Professional Development and Support

The same nine teachers that participated in the first interview schedule completed the second interview schedule. The second schedule was administered after professional development and support to teachers had been provided throughout the year.

Concept maps of 'giftedness'

Question 1: *Using a concept map show your conception of 'giftedness'.*

The second set of teachers' concept maps was analysed in the same manner as the first set. The word count totals ranged from 12 to 60 words, with the majority of counts being below 38, except for one teacher's concept map containing 60 words. Overall, teachers wrote fewer words in the second set of concept maps.

The semantic network analysis of teachers' concept maps of giftedness resulted in the same six core semantic areas that were identified in the first set of maps. These core areas included multiple intelligences, characteristics of the gifted, provision for the gifted, social issues, societal values, and the gifted as a sub-group of special needs. All the teachers included the multiple intelligences concept of the gifted, and provision issues on their concept maps. Six teachers mentioned the characteristics of the gifted in some way or another. Four teachers each noted social issues and the gifted as a sub-group of special needs. Two teachers commented on the impact of societal values on the gifted.

From the core semantic areas, related semantic sub-concepts were then identified, and these sub-concepts were variously refined into increasing degrees of complexity. For example, one teacher identified the 'provision for the gifted' core semantic area, and from this a network of three branches was constructed: 'mentors', 'community' and 'staff'. The network drawn from the 'staff' sub-concept was to 'special programs', which then divided into 'compacted curriculum', 'extension programs', 'work at a higher level', 'work with others of similar ability' and 'support for learning difficulties' categories. This pattern of refining was continued for the other sub-concepts. Table 4-13 summarises the data from the semantic network analysis for all participants.

Table 4-13

Teachers' Post-test Core Areas in Concept Maps of Giftedness

Core semantic areas identified	No. of teachers identifying core semantic area	No. of semantic sub-concepts of core area identified per teacher	No. of semantic sub-concept refinements per teacher
Multiple intelligences	9	1-6	1-3
Characteristics of the gifted	6	1-2	1-2
Provision for the gifted	9	1-4	1-5
Social issues	4	1-3	1-3
Societal values	2	1	1
Gifted as a sub-group of special needs	4	1	1

The before and after professional development concept maps of two teachers are reproduced below to illustrate differences in the maps over the research period. The concept maps were selected on the basis of maximum variation between teachers. Figure 4-4 shows the before and after concept maps for the teacher with the lowest word count (11) in the first schedule. In this figure it can be seen that the teacher initially focused on the domains of giftedness and a characteristic of gifted

children, while the later concept map included the domains of giftedness as well as classroom provision issues. Figure 4-5 presents the maps for the teacher with the highest word count (118) in the initial schedule. This figure shows that this teacher's conceptions developed, in the second schedule, to include more provision issues, such as acknowledging the necessity for support and providing it, recognising that the gifted may have learning difficulties that need to be addressed too, and counselling parents.

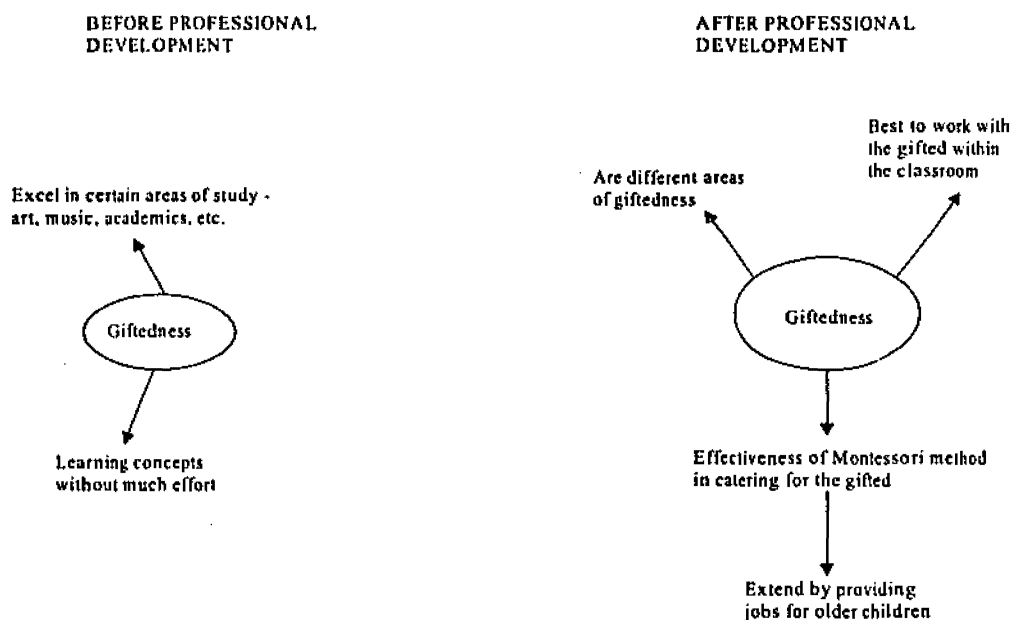


Figure 4-4. Teacher A's pre- and post-test concept maps of 'giftedness'

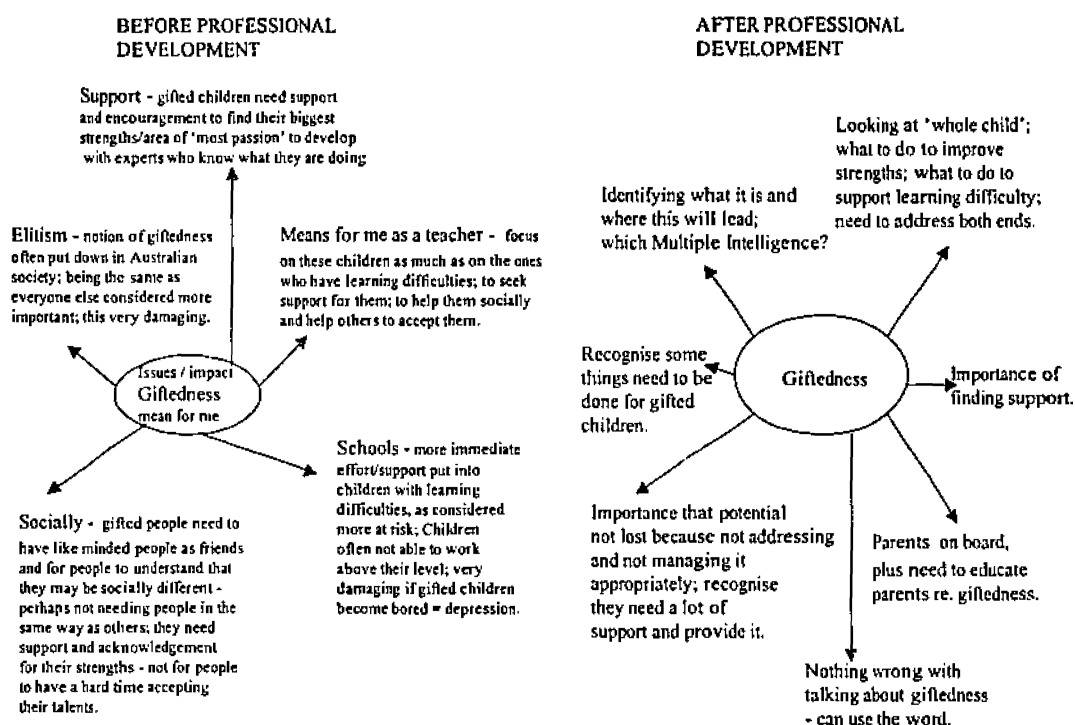


Figure 4-5. Teacher B's pre- and post-test concept maps of 'giftedness'

Identification of gifted children

Question 2: *How many students in your class have been formally identified as gifted?*

Question 3: *How were these gifted students identified?*

Question 4: *Do you think there are any students in your class who are gifted but have not yet been formally identified?*

At the beginning of the year three of the nine teachers indicated that they had one child in their class formally identified as gifted. At the end of the year two of the nine teachers stated they had one child in their class formally identified as gifted, while another two teachers each mentioned three children in their classes who had been formally assessed as gifted. Thus, by the end of the year the teachers' awareness of formally identified gifted children in their classes had increased.

As in the first schedule all the teachers, except one, thought there were gifted children in their classes that had not been formally identified as gifted. These

teachers named between one and eight children in their classes that they considered were gifted and indicated their area/s of giftedness.

Gifted underachievers

Question 5: *Do you think there are any gifted underachievers in your class?*

Question 6: *Who are your gifted underachievers in your class?*

Three teachers indicated that there were no gifted underachievers in their classes, while all the other teachers identified one child that was of concern in this context. Teachers in the second schedule were therefore identifying fewer students in their classes that were in the 'gifted underachiever' category.

Gifted students with learning difficulties

Question 7: *Do any of your gifted students also have learning difficulties?*

Question 8: *Who are your gifted students with learning difficulties?*

Question 9: *What specific difficulties do they have?*

Seven of the teachers stated that they had identified between one and three gifted children with learning difficulties in their classes. The other two teachers said there were no gifted students with learning difficulties in their classes. The most notable difference in responses between the two interviews was that teachers, in the second schedule, were more confident in naming students in this group. In the first schedule teachers expressed uncertainty about how to identify children who were gifted yet were also experiencing learning difficulties.

Classroom strategies (Questions 10 - 11)

Question 10: *Tell me about what you do in your classroom for gifted children. Please explain in detail, for example, how often does (insert child's name) do (insert teachers' strategies/ approaches)?*

Question 11: *Do you think these strategies/approaches work well?*

As in the first schedule, teachers listed a wide range of classroom strategies to cater for the needs of gifted children. Responses in the same five categories of strategies given in Table 4-12 were enunciated in the second interview, namely, strategies relating to teacher attitudes to gifted students, type of tasks, grouping, acceleration and staffing issues. All the primary teachers mentioned acceleration as a strategy they used in their classes. Acceleration usually took the form of subject acceleration, although year-level skipping was reported to have occurred in both the junior and upper primary levels. One new strategy that was mentioned involved rescheduling school hours for a student attending after-school extension mathematics

lessons. This student came to school one hour later, one day each week, to allow for the extra work involved in the extension maths program. Another new strategy discussed by one teacher involved increasing the challenge to the students by their participation in, for example, the Math-O-Quest (Mathematics Association of Western Australia, 2003) and Future Problem Solving (Future Problem Solving Program Australia Inc, 2002) programs. The involvement of mentors for the gifted students was another strategy employed during the year.

When teachers were asked how well these strategies worked all were reflective and raised various concerns. As outlined in the first interview schedule, teachers still had reservations about the effectiveness of their classroom strategies. Typical comments were:

- "Very demanding - each child needs different strategies, depending on the child, the day, the subject and topic."
- "Need support group with gifted peers" and "mentors in areas of children's gifts."
- "Very time consuming because you are dealing with self-management issues" and "behaviour problems". "Some [gifted] students are not independent enough to cope with extension work."
- "Parents need to be involved in the education, understanding, process."

Policy issues

Question 12: *What are your thoughts on the school's new policy on gifted and talented?*

Question 13: *Do you think the school's new policy on gifted and talented works?*

Question 14: *What do you think about the impact of the Curriculum Framework on the implementation of the Montessori curriculum?*

Question 15: *What do you think about the relationship between the Curriculum Framework and the implementation of the school's new policy on gifted and talented?*

In the first interview schedule teachers were asked about the school's "approach" to gifted children because no written policy on this issue existed. This lack of a written policy was acknowledged, so at the beginning of the school year (the research year for this thesis), a committee was formed to prepare a draft policy that would address the needs of gifted students. Throughout the year the various

versions of the draft policy were presented for comment to all the teachers at staff meetings and to the community at parent education sessions. This feedback resulted in modifications to the policy, the final version of which has now been adopted by the school as a statement of policy. Part of this document, called the *Whole Child Policy*, can be sighted in Appendix 10.

Teacher responses about the school's new policy, which addresses the needs of gifted children, were very positive. Typical responses were:

- "As a Montessori school we are concerned with the whole child; we need to meet needs wholistically; not separating out gifted children but meeting all children's needs."
- "Really good process. Excellent, every child accounted for."

When asked if the policy could be improved, eight teachers had suggestions. Representative comments included:

- "Teachers need reminding to set specific goals and re-examine these goals after the Collaborative Problem Solving team meetings at the beginning of the year."
- "Encourage all teachers that have some contact with particular students to take some responsibility for what happens to them."

The question that asked teachers about the impact of the *Curriculum Framework* (Curriculum Council, 1998) on the implementation of the Montessori curriculum was included because this issue was regularly raised during informal discussions as an added pressure on staff. Notwithstanding, six of the teacher responses were positive, indicating that there was "no conflict" between the *Curriculum Framework* and the Montessori curriculum, stating that they "complemented each other". However, three of the teachers disagreed with this point of view. One teacher said the *Curriculum Framework* was "time consuming and very hard to understand; not teacher friendly". Another comment indicated that it was "very hard to connect the two [the *Curriculum Framework* and the Montessori curriculum] together; the approach, the presentation of each was very different; they belonged in two different boxes".

The final policy question investigated the relationship between the *Curriculum Framework* and the implementation of the school's new policy that catered for the needs of the gifted. Seven of the nine teachers indicated that the relationship between these two documents was positive, using words like "great", "fits well" and "works hand in hand". However, one teacher suggested that the "biggest problem with the *Curriculum Framework* was how to assess a child's needs based on student outcome statements and then work out how to use this with the Whole Child Policy". Another teacher explained that the "*Curriculum Framework* outlines very broad areas and we group children more in class situations, but the Whole Child Policy looks at each child as an individual".

Training issues

Question 16: *During your Montessori teacher training, did you have any specific instruction in gifted education theories, methods and strategies?*

Question 17: *During your State teacher training, did you have any specific instruction in gifted education theories, methods and strategies?*

Question 18: *What professional development sessions, specifically on gifted education issues, have you attended since graduation as a teacher?*

Teachers were asked if they received any specific instruction in gifted education during their Montessori training. All the teachers indicated that such instruction was not part of their Montessori course. However, three teachers said that the course implicitly covered the needs of the gifted by emphasising that each child was different and required individualised instruction at their own level and pace. Furthermore, two teachers acknowledged that appropriate extension for gifted students did not always eventuate because of other teaching demands. One teacher stated that "Montessori implies the gifted will be catered for but this doesn't necessarily happen".

State teacher training for four of the nine teachers did not include any reference to gifted education. One teacher recalled "just books [on gifted education] that were recommended". Two teachers indicated that a 'special needs' unit they completed included gifted education studies. Another two teachers studied gifted education in a postgraduate context.

Five of the teachers stated that they had not attended any external professional development specifically on gifted education. The remaining four teachers had attended professional development sessions on the gifted, ranging from one day seminars to ongoing sessions.

The following two questions, 19 and 20, investigate the application of the training that the teachers had undertaken.

Question 19: *With reference to the professional development session/s mentioned in the previous question, how useful was/were the session/s, in terms of subsequent application of the PD in your own classroom context?*

Question 20: *What are your thoughts on the professional development on gifted education and follow-up support that has taken place at this school over the last year?*

Teachers who had attended professional development sessions on gifted education stated that it was particularly useful in that it provided guidelines for the identification of gifted children, and background information on giftedness that was useful in discussions with parents. One teacher emphasised that the session she attended outlined "very useful classroom strategies for gifted children". Another teacher said "it was a continuing process to bring it [gifted strategies] to life in the classroom". However, a third teacher noted her seminar was "not effective in providing useful classroom strategies". A different respondent acknowledged that it was "easy for a gifted child to miss out on what they needed because they seemed happy plodding on", given the demands on teachers to provide individualised programs for all children and to attend to urgent behavioural issues.

Teachers were also asked about the professional development provided in-house at the school by the author, as part of this research. Five teachers readily elicited key aspects from the in-service, namely, that 'giftedness' can be in a variety of domains, not just the academic domain, gifted students may have learning difficulties, different teaching methods are appropriate, the importance of facilitating opportunities for gifted children to mix with other gifted peers, and the value of following a child's passions and interests. Two of the nine teachers couldn't remember attending the session, and another two teachers said they had attended so many professional development courses over the year that "information overload" limited their recall of the issues presented at the gifted professional development session in question.

Other comments

Question 21: Is there anything you would like to add regarding our gifted policy, classroom provision for the gifted including those with learning difficulties, or anything else on this subject? Any comments?

All but one of the teachers chose to conclude the interview with additional comments. One teacher stated that "everything [gifted education in the school] was going really well". Other teachers were reflective about the topic, discussing identification of the gifted and policy matters, as well as the provision, social and staff issues that also arose in the first interview.

One teacher expressed increased awareness about the identification of gifted children. This teacher referred to the need for staff to be constantly vigilant because gifted children "may be identified at any time". A frequently raised issue about identification, however, was the teachers' remaining concerns about appropriately identifying twice-exceptional students.

Typical comments on school policy for the gifted recognised that "the whole school has to commit and follow through. Everybody must be committed in practice and theory".

Comments on provision recognised the strengths and weaknesses in current action. The positive aspects of being a Montessori school were stated, such as, "kids don't need an external reward for learning". Another teacher said it was important to "base extension of the gifted on the Montessori method ... because it works; it is hands-on. I like to extend [gifted children] in class". Other teachers mentioned deficits in current provision for the gifted, including, "our program needs more mentors" and "there needs to be more structure in the classroom".

Social issues relating to the gifted was another matter discussed by teachers. A typical comment was, "gifted children seem to have social problems; need to realign all the intelligences. Gifted kids need to be in the whole classroom, not singled out". Another point of view was expressed in the following comment. The teacher "want[ed] to develop an individual's gifts but also need[ed] to develop collective awareness of the environment and humanity, to benefit all".

Comments on staff matters related to the need for teachers to take "more responsibility for what is happening for 'support' [of gifted] children". Another

teacher requested that the in-house gifted education professional development presented at the beginning of the year be conducted again to revise understandings and review progress.

Changes in Montessori Teacher Interview Responses

A comparison of the before and after interview schedules revealed a number of changes in teacher awareness of, and provision for, the gifted.

An examination of the teachers' concept maps from the first interview schedule to the second schedule, revealed that although, overall, teachers used fewer words in the concept maps drawn during the second interview, more core semantic areas were identified by more teachers the second time. Fewer words were used in the second schedule to describe semantic sub-concepts of core areas and semantic sub-concept refinements per teacher. The most significant change in the concept maps between the two schedules was in the core semantic area relating to provision for the gifted. This core semantic area was mentioned three times initially, but all nine teachers wrote about provision issues in their second maps.

Teacher awareness of the identification of gifted children increased during the year. In the first interview schedule the teachers, overall, knew of three students who had been formally identified as gifted, but at the end of the year teachers named eight children in this group. With reference to gifted underachievers, fewer students were named in the underachiever category in the second interview, compared to the first interview. Teachers also appeared to have a clearer understanding of the identification characteristics for gifted students with learning difficulties in the second schedule. Unlike the first interview, all teachers expressed increased awareness when naming children in this group at the end of the year. Nevertheless, the teachers still indicated some outstanding concerns about the identification of twice-exceptional children.

On questions about provision for the gifted, the teachers reported using a wide range of classroom strategies. However, they also expressed some reservations about the effectiveness of these strategies. This was the case for both interview schedules. The main difference between the two schedules, in terms of the teachers'

responses on classroom strategies, related to additional classroom strategies being reported in the second interview.

The major change when reviewing the policy questions is the shift from an 'approach' to the gifted, with an absence of a written school policy in the first interview, to the development of a working, documented policy that catered for gifted children, in the subsequent interview. Teachers in the second interview also suggested numerous refinements to the new policy.

The responses to the questions on teacher training showed that the teachers did not receive any specific instruction in gifted education during their Montessori training and variable coverage in their state training. However, seven of the nine teachers had attended some form of professional development on the gifted prior to the in-house seminar conducted as part of this research. A majority of the teachers were able to recall some of the key issues from the in-house professional development presented at the beginning of this research.

In the concluding open-ended question of both interview schedules, most of the teachers took the opportunity to make additional comments. In both contexts teachers predominately expressed weaknesses, concerns, and difficulties they experienced, related to provision for the gifted.

In brief, the second teacher interview responses reflected increased awareness and improved provision for gifted children, tempered by an heightened understanding of the difficulties and complexity of working more effectively to cater for the needs of the gifted.

4.3 Analysis of Data on Provision for the Gifted and Teacher Outcomes

All the data sources were utilised to provide evidence on provision for the gifted. These data sources included the attitude scale, teacher interviews, informal observations, classroom observations, parent feedback, document searches and the researcher's reflective journal.

Attitude Scale

Results from the attitude scale data indicate that the teachers, overall, had a positive attitude about the needs of gifted children and support for special services. Grouping and Acceleration, Factors E and F on the attitude scale (Gagné, 1991), are two key strategies employed to cater for the needs of the gifted. Although the teachers were, overall, ambivalent about acceleration at the end of the research, this strategy was frequently used for students at the school who had been identified as gifted. However, attitudes toward grouping gifted children together were consistently negative. Follow-up discussions with participants indicated that this finding could be attributed to the multi-age structure of Montessori classes. Teachers considered that this feature of their classrooms enabled flexible ability groupings to be made informally, without separating gifted children into special classes.

Teacher Interviews

The analysis of the teacher interview data included discussion on classroom provision for gifted students.

Beginning of the School Year

The teachers identified a wide range of classroom strategies to cater for the needs of gifted students. They also mentioned reservations about the effectiveness of these strategies. Thus it appears that although teachers were working to provide for gifted students in the classroom, there were other factors that limited the success of the strategies employed.

End of the School Year

The analysis of the teacher interviews revealed improved levels of stated provision for the gifted at the end of the study period. Also teachers expressed their difficulties in catering for their gifted students, showing an awareness of the complexity of the endeavour.

Informal Observations

Informal observations of the six selected students who had been identified as gifted as well as experiencing learning difficulties in writing, were undertaken

throughout the school year and included all classes. These observations were made as the researcher went about the role of support teacher in the school. Observations were made in the students' classrooms, as these students moved around the school during work time, or while they were in the playground at lunchtime.

Beginning of the School Year

During class-time in the first term of the school year, informal observations of gifted students with difficulties in writing revealed three types of behaviour. First there were those students who appeared to be focussed on their work. They sat at their desks and worked quietly. Typically, they would write something down, appear to reflect, and then go on with more writing or erase part of what had been written, reflect and write again. A second category of students superficially looked like the first, in that the students were quiet and caused no obvious disruption to the class. However, closer observation revealed they were engaged in non-work activities. These non-obtrusive activities were usually in the form of social conversations with a neighbour and/or sitting at the desk just looking around and/or fiddling with desk equipment. The final category of behaviour involved more disruptive actions by some of the selected students, and the teachers noticed these actions. These behaviours typically included students arguing with others, including the teachers, or distracting other students from doing their work. The 'distraction' was more obvious than the 'heads down, quiet chat' of the second category. Students in this third category spoke loudly and sometimes there was physical interplay between the students, in the form of grabbing belongings and pushing.

The playtime behaviours of the six selected students revealed two broad categories. First there were the students that appeared to 'enjoy' this part of the school day, talking animatedly with other students, playing games and actively using the playground equipment. The second category of these students, in the outdoor setting, was the reclusive group. These children were typically found alone, for example, sitting in a corner reading, walking around on their own, sitting under a table, or sitting, curled-up, head down, apart from other students.

End of the School Year

During the year behaviour changes were observed for some of the selected students. This was particularly relevant for children in the third, in-class category

mentioned above. Those were the children who displayed disruptive, noticeable behaviours. Their behaviours changed, and seemed to alternate between behaviours typical of the first two categories, that is, sometimes they appeared focussed on their work and at other times they quietly engaged in non-work activities. For those selected students in the first two categories at the beginning of the year, in-class behaviours tended to remain unchanged. There was one noticeable exception to this, where the student concerned was able to focus and write an extended text by the end of the year, that is, he shifted from category two to category one.

With regard to informal observations of the selected students in the playground, changes were observed in the reclusive children. By the end of the year they were observed participating in more social interactions, walking around, talking and playing with other students. The earlier extreme behaviour of one gifted student, where he sat curled-up with his head down, was not evident in the second half of the year.

Classroom Observations •

Classroom observations of two of the six selected students were conducted. These observations were undertaken twice, once at the beginning of the research and once at the end, in two different age-level classrooms. One classroom observation series was in an upper primary class and the other was in a lower primary class. The objective of these observation sessions was to observe two gifted students with learning difficulties in writing and ascertain the degree of engagement in their independent work, their behaviour and the types of programs they were involved in.

The initial observations were undertaken during weeks 3 and 4 of the first term of the school year, after teachers completed the first interview schedule and gifted children with learning difficulties had been identified. Observation times were spread out over different school days at different times during the children's morning independent work cycle. (See Definitions section in Chapter 1, for clarification of "independent work cycle".)

To understand the following observations it is important to consider the Montessori classroom context. The children in the classroom were free to get out of their seats for any valid purpose, from selecting a book or a different task, getting a

drink, or something to eat, or a tissue; to asking another student for some assistance. Thus, except for whole class or small group sessions led by the teacher, children may be seen quietly moving around the class for different purposes; so a student out of his or her seat is not necessarily an indicator to the teacher that they are not working. Students are encouraged to be independent and seek out what they need to work on a task. If a student wishes to leave the classroom, however, then permission must be sought from the teacher.

Beginning of the School Year

In the upper primary classroom observation, the following session was typical. After appropriate scaffolding by the class teacher in a small group setting, the group was directed to start writing a recount. The scaffolding for the writing included strategies from 'First Steps' (Education Department of Western Australia, 1997b) and the 'Quality Teacher Program: Writing' (Association of Independent Schools of Western Australia, 2003c). The writing group included a Year 6 gifted student who also experienced difficulties in writing. During the group context phase of the lesson the student watched the teacher and looked around at group members. He did not volunteer any responses during the discussions. The key events over the next thirty minutes were:

The student returned to his seat from the group context, sat for a while and looked around, asked the teacher for permission to go to the toilet, came back, talked socially with his neighbour, walked to another desk to collect a blank recount plan sheet, returned to his desk, sat rubbing his face, wrote a few words, engaged in social talk with neighbour, copied words from his neighbour's recount plan, followed his neighbour to the whiteboard to look at the modelled recount plan, wandered around the classroom looking at what was on other students' desks, ate a biscuit at his own desk, copied one word from his neighbour's recount plan, engaged in social talk with neighbour, slid his neighbour's recount plan closer to his side of the desk and copied it, interspersing writing single words with eating and social talk.

The focus student was not disruptive to the running of the class, except for the interactions with his neighbour; that is, he quietly went about his various behaviours. Clearly this student displayed a lack of engagement with the task, and

this lack of engagement was typical when writing was involved. The quantity and quality of written work produced was below the appropriate level for Year 6. It is not entirely clear whether the low quality of written work is simply a result of lack of engagement, or whether the lack of engagement is an example of 'work avoidance' in order to avoid demonstrating his difficulty in writing. However, this student had been assessed to be below the WALNA writing benchmark in Year 5, so the latter is probable.

The lower primary classroom observations of another gifted student with learning difficulties in writing revealed some overlaps with the pattern of behaviour seen in the upper primary class. A typical example of this can be illustrated in a learning context that also involved writing a recount. This teacher similarly employed the writing strategies referred to in the former observation. The teacher's main aim for this gifted student was to encourage him to express his ideas on paper, since he displayed excellent oral recount skills but was unable to write his ideas in a structure appropriate for a Year 4 student.

The student talked with a neighbour, started first sentence of draft recount, erased sentence, talked with neighbour, wrote beginning of another sentence, erased last word, wrote word, erased word, talked to neighbour, wrote word and finished sentence, looked around, wrote several words, talked with teacher, continued writing, erased last word, wrote, erased last sentence, talked to neighbour, wrote sentence, erased last half of sentence, finished re-writing sentence, talked to neighbour.

During the lower primary observation the gifted student appeared to pay attention during the recount modelling and discussion phase of the lesson, that is, he watched the teacher and participated actively in the group discussions. However, when it came to writing his recount plan and starting his draft copy, he engaged in considerable diversionary conversation with a neighbouring student. The following extract from the observation notes is typical of this student's writing behaviour.

Over half the independent work time was spent in quiet discussion, predominantly on social topics rather than related to the writing task. When this student did attempt some writing, he became fixated on 'correct' spelling, despite encouragement by the teacher to 'have a go'. It was clearly very important to this student to not only spell correctly, but also to create 'perfect' sentences, even in his

draft copy, as he was continually erasing words and whole sentences. Consequently, at the end of a thirty-minute period this student had written three short sentences. (See work samples in Appendix 12.) This characteristic of the gifted, 'perfectionism', negatively impacted on this student's willingness to engage in this writing activity. The work samples show that this child had great difficulty producing written work at a Year 4 standard. As well as poor spelling, the student uses short sentences and the meaning is not always clear.

Both classroom observation sessions revealed a similar independent work pattern for gifted students with difficulties in writing. During a writing lesson the students were basically attentive when the genre was modelled and discussed, but engaged in diversionary activities when independent writing was required. This work pattern in writing lessons was repeated in other observation sessions and appeared typical of their behaviour. These students were not obviously disruptive to the running of the class; rather they quietly avoided work in their area of difficulty. As far as their writing tasks were concerned, they occupied their time doing what appeared to be unproductive activities (socialising) and employing superficial strategies (copying and erasing). Such avoidance strategies were not observed in their areas of strength; reading and mathematics in the case of the upper primary student; oral language, reading, mathematics and science in the case of the lower primary student.

End of the School Year

The upper primary gifted student with difficulties in writing received considerable support from the class teacher during the year. Various strategies were employed, such as moving the student to a desk adjacent to the teacher's desk, an individualised writing program with a tutor, as well as personalised time management and organisation contracts. These strategies were in addition to the ongoing use of writing scaffolds, which were mentioned earlier. Unfortunately for the continuity and effectiveness of all these strategies, the student was frequently absent from school throughout the year. It was also suggested to the parents of this child that neurobiological issues relevant to the student's difficulties be investigated. It was not determined whether this recommendation to the parents was adopted, as no feedback has been given to the school. Such feedback could help teachers to plan an optimum program for the student.

The behaviours displayed by the focus student in the following upper primary classroom observation were typical. The context for the thirty-minute observation session was report writing, on "Tiger Snakes", a topic chosen by the student.

The student wrote on the draft copy for approximately one minute, looked around the room for another minute, took draft to show the teacher, teacher encouraged student to consult reference books, student went to the library in the next room, selected a text and read for six minutes, closed the book and looked at the cover for over two minutes, wrote more notes during the next two minutes, returned to the classroom, showed the teacher, sat down at his desk and continued writing, looked up and turned to look behind him at the computers being used by other students, wrote a single word, talked to a student passing the desk, continued writing, looked back at the computers, returned to writing, looked at computers, continued writing, stood up and said "Done!" to the teacher.

The turnaround time for each of the different events in the second half of this observation was 30-60 seconds, for example, the student wrote for 40 seconds then looked at the computers for nearly 60 seconds, and so on. As in the observation at the beginning of the school year, it was again the case that the focus student was not disruptive to the running of the class. The student quietly went about his various activities, which did include completing the writing task independently. However, despite numerous interventions employed by the class teacher during the year to support this student, the student continued to be easily distracted, with a very short span of concentration.

The gifted lower primary student who had difficulties with writing also experienced considerable support through the year. This support was in the form of additional writing scaffolding and closer monitoring of his daily work contract by the classroom teacher, as well as one hour per week tutoring sessions on writing with the support teacher. Two forms of external intervention also occurred after recommendations by the school to the parents to investigate neurobiological issues that may be impacting on the child's writing difficulty. The student participated in occupational therapy for fine motor skill development and behavioural optometry for eye exercises. The following 30 minute segment from the classroom observations of

this student was typical of his end-of-year writing behaviour. The writing context was a recount of "My Earliest Memory".

The student wrote the title, looked around the room, looked at his pencil and fiddled with it, talked socially with his neighbour, wrote the first word of the first sentence, looked up and watched students doing a maths activity on the class mat, wrote another word, erased it, talked with his neighbour, fiddled with his pencil, wrote two words, erased last word, looked at students working on the mat again, talked with another student who had approached his desk then talked with his neighbour. The student put his writing away and selected the same language activity book that his neighbour was working on, he selected the same page as his neighbour. The class teacher intervened and requested that the focus student complete the writing task. The student took out the recount again and resumed writing, erased the last word, wrote, erased, wrote, erased, ... pattern continued Another student approached focus student's desk and talked socially. Class teacher requested this student go on with his own work. Focus student looked around, talked with neighbour, fiddled with his pencil, resumed writing - erasing pattern; student went to stand next to teacher, gave his writing to the teacher. Teacher read writing and responded immediately, the student smiled and replied in an animated manner.

Compared to the first classroom observations of this lower primary student, the end-of-year observations revealed minimal changes. The student had written only three sentences (half a page) in the half-hour session, and still displayed perfectionism, typified by continual use of the eraser, and was readily distracted by other students. (Refer to Appendix 12 for work samples.) However, when this student was observed in a test situation, for the end-of-year Student Outcome Writing assessment (EasyMark, 1997), and all students were doing the same task, this student wrote a narrative one and a half pages long, in a similar period of time as the above observation. So despite being readily distracted by external events the lower primary gifted student showed he could now write longer texts. An indication of the quality of these end-of-year texts can be found in the student outcome data in a later section of this chapter and the report writing work samples in Appendix 12.

The beginning and end of year report writing work samples indicate the student's writing development. The samples show that at the end of the year,

compared to early in the year, the student was able to write more sustained texts that made sense and displayed increased complexity of language, in a similar writing-time period. It is important to note that the beginning of the year sample was written in-class, while the end of the year text was written in a quiet, non-distracting withdrawal context in the presence of the support teacher. So, when this student is on his own (or in a quiet test environment), he can write for an extended period. Clearly this gifted student's writing improved during the study. At the end of the year he could write longer, more logical and complex texts. Nevertheless, he still requires further support, as his writing is still not indicative of the strength of his oral language skills.

In summary, when the beginning-of-the-year and end-of-the-year classroom observations were compared, for both the upper and lower primary contexts, it appeared that the students' observable behaviours had not markedly changed. Student distractibility seemed to be an important component of the lack of task engagement. Both students had difficulty in writing a coherent text with correct spelling at the beginning of the year. This was apparent both in class and as individuals in a withdrawal support context. Nevertheless, by the end of the year, both focus students showed they could write longer, more coherent texts. Thus the numerous interventions undertaken during the year, to support these students' writing difficulties, could have contributed to these outcome gains.

Parent Feedback

Parents provided feedback about their children to the researcher in two ways: first by attending formal meetings and second through informal conversations.

Parents attended two types of formal meetings. First, Parent Education sessions, and second, Collaborative Problem Solving team meetings. Two Parent Education sessions were conducted by the support teacher (researcher) at which the Whole Child Policy was presented for discussion.

Those present at the Collaborative Problem Solving team meetings were: one or both parents, the class teacher, the principal, the support teacher, as well as any relevant specialists (for instance, the psychologist or occupational therapist who had assessed the child). Sometimes the student was involved too, for part of the meeting,

to make his or her contribution about an issue. Any person involved with the child initiated appointments for these meetings, and they always occurred after the class teacher and the parent/s had participated in a teacher-parent interview.

Informal discussions with the support teacher (researcher) provided parents with another avenue to seek advice and express their concerns. These discussions arose from appointments with the support teacher and from incidental meetings as the support teacher walked around the school.

Beginning of the School Year

At the beginning of the school year Collaborative Problem Solving meetings were called to discuss the needs of all the children in the school. At this initial meeting the participants (the principal, class teacher and support teacher) provided information about each child, brainstormed support strategies where needed, and documented actions to be taken. With regards to catering for gifted students, previous assessments and reports were analysed, strengths and concerns discussed, and action plans developed to support particular needs. In conjunction with the parallel development of the school's Whole Child Policy at this time, it is important to note that these meetings included a 'whole' child perspective. Thus, discussions about writing difficulties for example, referred to not only teaching strategies, but behavioural optometry needs, occupational therapy for fine motor skill development, social-emotional issues and parent education as well. Consequently, by the end of first term most parents of identified students had participated in follow-up Collaborative Problem Solving meetings with the principal, class teacher and support teacher.

Informal discussions with the parents of gifted students also revealed that they were concerned about their children, both in terms of extension work to support their strengths as well as interventions to assist writing progress. These parents came to the support teacher to discuss their concerns and options. One issue raised by a parent queried the use of acceleration in the school, in that it appeared that some teachers provided this option for gifted students, but others said the children would ask for it if they needed acceleration. This parent considered that such an approach could result in some gifted children not having their needs met.

Parents wanted to know what the school was doing to support their child, in addition to what they could do to assist. In every case, except one, parents came to talk to the support teacher because their child was "not happy". The parents conveyed the opinion that, for example, the child was misbehaving because the child perceived "the work to be dull and boring"; or the child was withdrawn and disinterested because s/he "wasn't being challenged". Social-emotional issues were raised in most cases. One child, for instance, was "dreading returning to school and all that monotony", another child was said to be "depressed about school" and was attending a psychologist. Only one parent did not mention the child's feelings, but spoke instead in objective terms, about the child's writing difficulty and how much school support the child was going to receive during the year.

End of the School Year

All the parents of children who had been identified as gifted and having difficulties in writing, attended numerous meetings, formal and informal, at the school throughout the year, to discuss the needs of their children. The formal Collaborative Problem Solving review meetings were called once or twice a term, depending on the various stakeholders' perceptions of how the child was progressing. Informal meetings with class teacher, the principal and/or the support teacher were ongoing, ranging from information 'catch-ups' once a week to once a term, depending on the participants' needs.

The parents of these gifted children, depending on their individual circumstances, were able to support their children from home through different interventions. For instance, when recommended by the school parents arranged appointments to obtain specialist assessments for their children, and parents supported their children's attendance at out-of-school enrichment activities.

By the end of the school year, feedback from these parents was basically positive. Parents were satisfied with the progress their children had achieved and approved of the new 'Whole Child Policy'.

Document Searches

Four types of school documents were examined: student data files, school history notes, school philosophy statements and school policy documents.

Beginning of the School Year

Student data files included information about the 'whole child', educational outcomes assessments and specialists' reports. Results of additional assessments conducted by the support teacher, such as tests of phonological awareness (Love & Reilly, 1995), and a battery of visual, auditory, and fine and gross motor assessments (Pickering & Alegria, 1999) were also kept in these files. The files were accessed to obtain a clear picture of the child's progress and specialist reports on strengths and weaknesses. The next major section in this chapter, on outcomes, analyses the data on the children's progress. The specialist reports were referred to at the Collaborative Problem Solving team meetings and recommendations considered.

The school history notes revealed that the school was started by a group of dedicated parents who shared understandings about the Montessori philosophy and believed they could create an innovative, caring and community-based school, which exemplified a "love of learning". There was no mention of giftedness or learning difficulties in these notes.

An examination of the school philosophy documents included the philosophy of learning, strategic plan, code of ethics and mission statement. The "love of learning" theme continued in these documents, with positive values like "building on your strengths" and "recognising and appreciating differences". All statements were in general terms, such as, "[children] have a right to choices of suitable educational opportunities appropriate to their stage of development". There were no specific references to giftedness, or encouraging excellence, or issues relating to learning difficulties, rather, statements had general wording, like the child has a "right to learn". Similarly, school, staff and parents rights and responsibilities were in broad, positive statements, reflecting a caring, nurturing learning environment.

At the beginning of the school year there were no school policy documents addressing the issues of gifted students, or those with learning difficulties. Despite this lack of formal, approved documentation, there were some informal written

statements and procedures in place in the school that sought to support students with special needs. These statements and procedures fell into two categories: first, in-class strategies directed by the class teachers and second, extension and support work with identified students undertaken by the school's support teacher (researcher).

End of the School Year

At the end Term 4, 2003, the students' files were re-examined. It was clear that many actions had been implemented during the year, both by school staff and parents, to support observable outcome gains. These actions ranged from, for example, the implementation of specific in-class time-management contracts, to recommendations for external specialist assessments, external therapy sessions, as well as individual tuition with the support teacher.

A major achievement of the year was the documentation and implementation of the 'Whole Child Policy'. An extract of this policy can be sighted in Appendix 10. In brief, the 'Whole Child Policy' aims to identify and cater for the needs of all children in the school. It recognises the special needs of gifted students, including those who also experience learning difficulties. It provides strategies to approach the challenges thereby identified. This is a significant advancement for the school in addressing the special needs of individual students.

Reflective Journal

A review of the researcher's reflective journal identified four major themes: the research itself, teacher individuality, teacher collegiality, and finally, teacher stress (see sample pages in Appendix 13).

Beginning of the School Year

The theme on the research itself embraced a number of different aspects and provided data relating to the second and third research questions which related to provision for the gifted. The first aspect of the research theme involves initial feedback on the proposed research, from the school's Management Committee. An outline of the research was presented to the Management Committee prior to university approval of the research. As far as the research was concerned, it was a requirement of this Committee that there be no reference to 'gifted' in any

correspondence or discussion with parents, rather, only terms including 'strengths', 'weaknesses' and 'special needs' could be used. This approach was required because it was seen to fit with the school's philosophy toward learning. However, the use of the term 'gifted', between teachers, was acceptable because it facilitated clear discussions and reference to professional literature.

Next there was the feedback to the initial letters distributed to all stakeholders about the proposed research. It was not so much 'feedback', as lack of 'feedback'. Only three staff members and one parent gave spontaneous comments on the proposed research, that is, overall very little interest was expressed directly to the researcher. The comments were in the form of 'it looks interesting'. Perhaps the very general, innocuous, wording of the letters (see Appendices 6-9) resulted in the stakeholders not really being aware of what the research was actually investigating. This lack of response to the initial letters appeared to be in direct contrast to the urgency, passion and distress that some parents revealed in both formal and informal meetings about provision for their children's 'special needs'.

Another reflection on the research itself related to the researcher's perception of the operation of the cycles of action research. A clear, broad-brushed picture of how the research was expected to progress was envisaged, with each stage orderly and logically following upon the other. Minor changes were expected, but it was anticipated, in line with Gross' (1997) findings, that teachers would participate in the professional development, and with support given by the researcher, make some changes in their attitudes and provision for their gifted students.

The professional development component phase of the research superficially went as planned. The topics presented (as outlined in Chapter 2) were well received, with teachers listening attentively and asking relevant questions. The evaluation forms, completed at the end of the professional development session, indicated that teachers gained new understandings about gifted education, such as the existence of twice-exceptional children. Teachers also stated that they had difficulties identifying these children in their classes. Following the professional development session, teachers were provided with information and resources in response to the particular questions and issues they individually raised.

The second reflective journal theme related to teacher individuality. How teacher individuality would impact on the research was unpredictable, but it was seen

as a significant factor, even in the early days of the research. The researcher had been working at the school four years prior to the commencement of the research and was aware of a wide range of attitudes, beliefs, philosophies, and teaching practices amongst staff members despite all being Montessori teachers. For example, teachers' different philosophical outlooks impacted on how they interpreted student behaviour. There were varying interpretations of the actions of a disruptive gifted child who resisted participation in challenging activities. One teacher interpreted the disruptive actions as the child not wanting to participate in extension work and as choosing to have a 'care free childhood', but a different teacher indicated that the behaviour arose because of the child's strong sense of perfectionism and negative attitude toward risk-taking (Kerr, 2002; A. Martin, 2003b). Another illustration of differences in teachers' interpretations can be seen in the following section on teacher attitudes toward students.

A further aspect of the teacher individuality theme was concerned with teacher attitudes toward gifted students. Having worked in a number of different schools, both state and independent, the researcher observed the very positive attitude of the teachers of this school toward all students in the school. Staff room discussions about students, whenever they arose, were always in positive terms. Teachers consistently took a positive stance, that is, asked 'what can we do to support this child'. However, this overall positive attitude toward gifted students may also be interpreted as a scotoma in some contexts, in that different teachers' interpretations of the same situation could vary. For instance, seeing a gifted child keeping up with their set work and happily interacting with others, could mask the gifted child's need for challenge and extension. Some teachers have expressed the view that if the child was progressing 'nicely' and was 'happy', why place him/her under pressure? Thus, in a subtle way, a positive teacher attitude concerned with enhancing 'childhood joy', may blinker awareness of the need for challenge.

Teacher collegiality was another theme of the researcher's reflective journal. The teachers shared their resources, information and concerns with each other, in an actively co-operative manner. For example, informal discussions with an upper primary class teacher revealed that she was aware of the problems a particular gifted student was experiencing, and was working to address the writing difficulty by employing a range of strategies. These strategies, adopted after liaison with other

staff, included additional scaffolding as well as participation in a support writing program. Similarly, discussions with a lower primary class teacher revealed full cognizance of the writing difficulties of her gifted students and the preparation of various support interventions. These interventions and writing programs were developed by staff sharing resources and ideas, as illustrated by the on-going additions made to a 'Writing Resource File' located in the teachers' library.

Teacher stress was the final journal theme that emerged. The issue of excessive pressure and expectations on teachers arose frequently. Teachers stated that they did their best to meet students' individual needs but there was a limit to what they could do, given the varying needs of all the children in their classes. As stated in the school's code of ethics, teachers had a right to 'a private life', and teachers struggled to find balance in their working and private lives. During the first term of the school year, after the Collaborative Problem Solving team meetings, teachers had an extensive program of individual requirements to monitor, and this was seen as a significant challenge.

End of the School Year

By the end of the school year there were many twists and turns to the theme on the research itself, with the theme of teacher individuality weaving unique patterns throughout it. At the beginning of the year it had been naively envisaged that the school would operate as a 'whole', with regards to the operation of the action research cycles. After the initial professional development, instead of one action research cycle being relevant to the whole school, a series of mini action research cycles running for each class was observed. The different teachers, each expressing their own individuality with regards to educational philosophy and understandings, acceptance of new information and pace of implementation of new strategies, all operated within their own, differing, action research cycles. Thus, although there was an overall whole school approach with the presentation of gifted education in-service for all staff, the development and implementation the Whole Child Policy, as well as curriculum and resources support to all teachers, it was clear that teachers operated at different phases and levels of the action research cycle (see Appendix 13). It appears that the effectiveness of the professional development was variable. In conjunction with the teacher stress theme discussed below, some teachers were not able to absorb and utilise much of the information provided. However, other

teachers' awareness and interest in this field was raised, and some chose to attend additional external professional development sessions on gifted education.

Teacher individuality also had a marked impact on the research, with some teachers embracing the new understandings about the gifted enthusiastically and others adopting these different ideas tentatively and slowly. This observation is supported by data from the attitude scale analysis and interviews; namely, that teachers did not change their original beliefs and attitudes, but did participate in the implementation of new strategies for the gifted and the Whole Child Policy.

Throughout the study the researcher sought to model the use of some of the teaching strategies appropriate to provision for gifted students. This was seen as one way the researcher, as a staff member, could provide curriculum and resources support to improve classroom provision for gifted children. During the four terms the researcher worked with all the selected children, in different projects, at different times. The teaching strategies included specific activities, such as accessing on-line gifted sites (Virtual School for the Gifted, 2004) and the involvement of technical experts in projects. Also, the researcher drew on broad principles in gifted education, for example, facilitating students to employ creative thinking skills to investigate their chosen topics, and providing structural and organisational guidelines to students so they could handle complex projects (Future Problem Solving Program Australia Inc, 2002).

The teacher collegiality and teacher stress themes remained as important issues for the staff during the year. The teachers continued to share resources, information and concerns. This was an ongoing characteristic of the current staff at the school. The issue of teacher stress arose frequently when staff were together. Teachers expressed the view that there was a limit to what they could do without becoming 'burnt out' and that they had a right to a 'private life' out of school. Related to this issue was continual reference to *Curriculum Framework* (Curriculum Council, 1998) requirements and government imposition on the running of private, independent schools. For example, to obtain various educational funding grants for students with difficulties, independent schools were required to participate in the WALNA testing (Association of Independent Schools of Western Australia, 2003d) and provide increasing data and evidence about these students. Teachers said more time was being spent on these administrative requirements, so less time was available

for creative lesson preparation. Also some teachers expressed the view that external government requirements meant there was less time for implementing the Montessori curriculum and this was detrimental to the children's development.

Summary

All the data sources were used to provide evidence on provision for the gifted. These ranged from the attitude scale, teacher interviews, informal observations, classroom observations, parent feedback, document searches, to the researcher's reflective journal. An analysis of these sources suggested that teachers accessed a wide range of teaching strategies to support gifted students, however these students were not always able to benefit from these approaches. In particular, some of the selected students required more structure when working independently, and a reduction in distractions, to enable the strategies to assist them. Furthermore, the teachers identified other issues that reduced the effectiveness of the teaching strategies that they attempted to employ.

4.4 Analysis of Data on Student Outcomes

Numerous sources of data were used to ascertain student outcomes. These sources included classroom observations, parent feedback and document searches of student files to obtain results of assessments.

Classroom Observations

The key findings from the classroom observations of the two focus students are presented in Table 4-14. A comparison of the beginning and end of year classroom observations reveals that in both the upper and lower primary contexts, the students' observable behaviours had not markedly changed. They were still distracted from their writing by other events. See work samples in Appendix 12.

Table 4-14**Pre- and Post-test Classroom Observations of Two Gifted Students**

Selected Student	Term 1 2003	Term 4 2003
Year 4 Junior Primary	Wrote three short sentences in 30 minutes (see Appendix 12, Recount: "The leaves on the tree ...").	Wrote three longer sentences (half a page) in 30 minutes (see Appendix 12, Recount: "My Memorys").
	Continually erased words and whole sentences.	Continual use of the eraser.
	Social talk with neighbour.	Distracted by external events.
Year 6 Senior Primary	Wrote one to several words each writing attempt (Recount: "Eureka Stockade").	Wrote one to several words each minute of writing, then lost focus on task (Report: "Tiger Snakes").
	Copied neighbour's writing.	Wrote independently.
	Social talk with neighbour.	Very frequently distracted by external and internal stimuli.
		Frequent use of eraser.

Despite the lack of change in the students' observed writing behaviours, an analysis of the children's texts indicated that writing gains were achieved. To be consistent with writing assessments used at the school, the following EasyMark (1997) writing aspects were employed to analyse the students' texts: global, punctuation, spelling, vocabulary, sentence control, form of writing, subject matter, text organisation and purpose and audience. See Appendix 14 for an explanation of the relevant 'global' levels (L2, L3) and the writing aspect scales (1-3). The analysis, presented in Table 4-15, provides evidence that the students' achieved improvements in writing outcomes. For example, in writing a report, the Year 4 student improved in all areas except choice of subject matter, and the Year 6 student improved in all areas except punctuation and choice of subject matter.

Table 4-15
Analysis of Students' Texts

Selected Student	Writing Aspect	Term 1 2003		Term 4 2003	
		Recount	Report	Recount	Report
		"The leves on the ... "	"The tiger's skin ..."	"My Memorys"	"Wild Cats"
Year 4	Global	2	2	2	3
Junior	Punctuation	2	1	2	3
Primary	Spelling	2	2	2	3
(see work	Vocabulary	2	2	2	3
samples in	Sent. Control	1	1	1	2
Appendix	Form Writing	1	1	2	3
12)	Subj. Matter	2	2	2	2
	Text Organis.	1	1	2	3
	Purpose Aud.	1	2	2	3
		"Eureka Stockade"	"Gold Mining"	"Craft Fair"	"Tiger Snakes"
Year 6	Global	2	2	3	3
Senior	Punctuation	3	3	3	3
Primary	Spelling	2	2	3	3
	Vocabulary	2	2	2	3
	Sent. Control	1	1	2	2
	Form Writing	2	2	3	3
	Subj. Matter	2	2	2	2
	Text Organis.	2	2	3	3
	Purpose Aud.	2	2	3	3

Parent Feedback

Overall, the parents of the selected students were satisfied with the progress their children made during the year. Despite some on-going difficulties for some of the children, parents were pleased with the development of their 'whole' child.

Document Searches

Assessment records in student files were examined. Data relating to the six selected students in the school was collected and analysed. These six students had been formally identified as gifted and were experiencing writing difficulties. The two students referred to in the classroom observations, are included in this group of six. Their assessments results have not been presented in isolation, but with the whole group, to protect their identity.

The results of standardised literacy assessments undertaken by the six students, in 2002 and 2003, are presented in Appendix 14. An analysis of that data shows that although these gifted students had, at some stage, experienced difficulties in writing, they displayed strengths in reading comprehension, and often spelling as well.

During 2002, three of the six students obtained lower writing assessment results at the end of the year compared to the beginning of the year (based on an externally marked recount for junior primary and a narrative for senior primary students). Although the other three students improved over the year in the EasyMark writing test (EasyMark, 1997), other indicators identified them as experiencing writing difficulties. These indicators included below or marginally above WALNA benchmark writing results (Association of Independent Schools of Western Australia, 2002), work sample standards, writing conferences with the class teacher and reports from educational psychologists. Thus, these six gifted students were targeted for writing intervention in 2003.

In 2003 three of the selected students participated in the WALNA testing (because they were 8, 10 or 12 years old that year) and all three were assessed to be above the writing benchmark for their age. However, the externally marked writing test (EasyMark, 1997), used to assess all primary students in the school, resulted in variable outcomes for the six selected students. One student improved dramatically

during the year, with an assessment of writing Level 2 Stanine 4 for Term 1 and Level 3 Stanine 7 in Term 4 (refer to Appendix 14 for an explanation of levels). Three of the six students were assessed to be at the same writing level and same stanine at the end of the year as at the start. The remaining two students were assessed to be on the same level but a lower stanine at the end of the year. These formal assessments of writing outcomes should be considered in conjunction with untimed, informal assessments. An examination of informal writing work samples clearly indicated that all the selected students achieved writing outcome gains. These gains were shown in genres other than the formally assessed recount or narrative, by a willingness to 'have a go' and the writing of longer texts. This is illustrated in the report work samples shown in Appendix 12 and evidence provided in Table 4-15.

4.5 Member Checks

Conducting member checks was an on-going process throughout the study. All staff were provided with copies of draft sections of this thesis. They were encouraged to make comments, corrections and suggestions, as well as to indicate if they considered that there were inaccuracies or misconceptions. Feedback was also sought from parents in the school community and professional colleagues.

One example where teacher feedback was particularly useful related to the interpretation of the attitude scale data. As was mentioned previously the teachers indicated a negative attitude towards grouping gifted students together (Factor E). After further discussion with the teachers and a review of the literature on the Montessori method of education, it was clear that this finding was not so much a negative attitude toward the gifted, as a re-affirmation of the teachers' commitment to MAGs.

Another instance showing the value of member checks also involved the attitude scale results. When the Wilcoxon Signed Ranks test was applied for Factor F, School Acceleration, the result was significant (see Table 4-3). This result was unexpected because the school has employed this strategy, where it was deemed appropriate, for many years. It was one of the most common strategies used in the school to cater for the gifted. Thus teacher feedback was sought on this finding.

Member checks indicated that the result was probably an expression of teacher stress, related to the development of detailed individualised student programs, rather than a change to a negative attitude toward acceleration. Indeed, during these follow-up informal discussions teachers expressed the same overall favourable attitudes toward acceleration that were characteristic of their initial responses to the acceleration items in the attitude scale. Positive attitudes toward acceleration had also been indicated in the teachers' interview responses.

A further example of the value of member checks relates to the concept maps, which were part of the interview schedules. Overall, teachers used fewer words for their second maps. Subsequent discussion with the teachers again highlighted the 'teacher stress' theme. Teachers indicated that at the end of the school year they felt too busy and pressed for time to write wordy responses. So, rather than it being a case of lack of awareness, as the concept map results may have initially and superficially implied, member checks suggested that it was more an instance of 'teacher stress' in action. Nevertheless, perhaps this interpretation needs to be viewed with some caution, since the initial concept maps were also developed by teachers at the same busy, report-writing time, in the preceding year.

Staff feedback on the draft chapters of the thesis was limited. Most of the comments were general and of a supportive nature. However, one teacher gave some insightful feedback about the methodology; with reference to the difficulty of employing action research in the whole school compared to one's own classroom. Finally, one parent in the school community provided detailed written comments on the draft thesis, highlighting issues that required further clarification.

In brief, conducting member checks was a valuable component of the present study. Within the constraint of working with busy teachers, their additional feedback not only enhanced broader ownership of the research but also increased the trustworthiness of the findings.

4.6 Summary of Main Findings

Numerous data collection methods, including an attitude scale, interviews, observations and document searches, were used in this study to enable triangulation of the findings. An analysis of the Gagné & Nadeau attitude scale, "Opinions about the gifted and their education" (Gagné, 1991) was employed to investigate Montessori teachers' attitudes toward the gifted. It was found that although the individual teachers held widely variable attitudes toward the gifted, overall, their attitudes were positive toward the gifted and their education. The teachers' attitudes did not change significantly over time, despite professional development and a year of curriculum and resources support. Nevertheless, the Montessori teachers reported the use of a wide range of teaching strategies in their efforts to cater for the needs of the gifted. Although they used different strategies, selected on an individual basis according to the specific needs of the gifted children, the teachers were aware of limitations in their programs. In particular, some gifted students' inability to work independently and focus on their own study impacted on the success of the teachers' attempts to provide for the gifted. All gifted students in the study achieved either improved behavioural and/or writing outcomes. These results are discussed in more detail in the following final chapter, Chapter 5 Discussion and Conclusions, and are the basis of numerous recommendations on educational provision for gifted children.

CHAPTER 5

DISCUSSION AND CONCLUSION

This study set out to describe teachers' attitudes toward the gifted, classroom provision for gifted children with learning difficulties in writing, and the outcomes for teachers and the selected students. Within an action research context all the teachers at a small Montessori school participated in the study. At the beginning of the research year the teachers' attitudes toward the gifted were examined by the administration of a widely used attitude scale (Gagné, 1991) and an interview related to the children in their classes. The teachers then attended professional development on the gifted. In the months that followed, the teachers were provided with resources and curriculum support for their gifted students. At the end of the research year teachers participated in the re-administrations of the scale and interview schedule. In addition, throughout the year, classroom and informal observations were conducted, along with document searches and field notes on parent feedback. All these sources of data were analysed, providing evidence to address the research questions.

This chapter reviews the key findings of the study. Next, findings and implications for teachers and students are examined in the context of literature in this field. Conclusions related to each of the research questions are then drawn. Further implications of this study are discussed, such as issues relevant to school administration, teacher education and the methodological design of the research. The chapter finishes with a discussion of possible areas for future research.

5.1 Key Findings

The key findings of the research are presented with reference to the research questions. Each research question is presented in *italics* followed by the findings that answered that question.

Attitudes Toward the Gifted

1. *What are the attitudes of teachers toward gifted children, and the associated classroom provision needs of these students, before professional development and after a period of enactment?*
2. *Do teachers' attitudes change?*

Teachers in the study indicated positive attitudes towards the gifted, as measured by the "Opinions about the gifted and their education" attitude scale (Gagné, 1991). However, attitude change, determined by two administrations of the attitude scale (Gagné, 1991), did not appear to occur. The pre- and post-test analysis of the scale data revealed no significant change in teachers' attitudes during the year, except for Factor F, Acceleration, which changed to a less positive attitude. Overall, teachers maintained a positive attitude towards the gifted throughout the study.

Nevertheless, increased teacher awareness of classroom provision issues was indicated in responses to the second interview schedule. Provision issues were listed by all nine teachers in their second concept maps, compared to listing by only three teachers in the first concept maps. This finding, along with observational evidence, such as teachers' willingness to trial new strategies to support gifted children, as well as to contribute to the development of the special needs policy, suggest there were changes at the behavioural level, if not the attitudinal level, as teachers' practices in the classroom did change during the year.

Further support for the finding that changes occurred in teachers' behaviour toward the gifted came from parent feedback. For example, one parent stated that the class and specialist teachers recognised a positive change in one of the selected students and this reinforced the teachers' belief in the effectiveness of the intervention undertaken (in this case, accelerated mathematics). As the year progressed, the student was more highly motivated in all aspects of his work and his classroom behaviour was more co-operative. According to the teachers and the parent the individual modifications to that child's program were worthwhile.

So, despite no significant change in overall attitudes toward the gifted as determined by the attitude scale, changes in teachers' behaviour towards the gifted, from a practical point of view in the classroom, were apparent and had positive learning outcomes for some students.

Provision for the Gifted

3. What modifications, if any, are made to gifted children's programs after staff professional development?

Overall, the teachers had a positive attitude about the needs of gifted children and support for special services. Grouping and Acceleration, Factors E and F on the attitude scale (Gagné, 1991), are two key strategies that are employed to cater for the needs of the gifted (Gagné & Nadeau, 1983; Gross, 1997; Maker & Nielson, 1995). Although the teachers indicated a less positive attitude toward acceleration at the end of the year, this finding was re-examined because it seemed to contradict practices in operation at the school. Acceleration was a frequently used strategy for gifted students in this school, in the form of subject-acceleration as well as skipping year levels. Attitudes toward grouping gifted children together were, however, consistently negative. This finding could be related to the multi-age structure of Montessori classes. This characteristic feature of Montessori classrooms enables flexible ability groupings to be made informally within the class, without separating gifted children into special classes.

Further evidence for a positive attitude toward provision for the gifted was provided by the interview and observational data. Teachers mentioned additional classroom strategies employed during the year in the second set of interviews. Classroom and informal observations confirmed that teachers made program modifications for the focus students. These modifications sought to support the special needs of the students concerned and appeared to be more closely tailored to individual students' needs.

Teachers participated in the development of a policy that catered for the provision needs of the gifted. Document searches verified that there was an absence

of a written special needs policy prior to the commencement of the research, although the general wording of earlier documents suggested broad principles to guide the teaching of gifted students. The "Whole Child Policy", a written statement that outlined the process for meeting the special needs of children at the school, including gifted students, was completed by the end of the research year. This policy was developed by a committee consisting of the principal and two teachers, including the researcher, with the input of all the teachers at staff meetings. By this process, teachers' awareness of the gifted and their associated classroom provision needs, was highlighted.

Thus it can be seen that teachers made modifications to their students' individual programs as the year progressed, and they continued to trial new strategies in circumstances where it appeared that little progress was being achieved.

Outcomes for Teachers and Students

4. What are the outcomes for teachers and students after professional development and a period of enactment?

Teachers

By the end of the year, teachers reported increased awareness of formally identified gifted students in their classes. They also identified fewer students in their classes as 'gifted underachievers'. Furthermore, by Term 4, teachers were generally more confident in naming gifted students with learning difficulties. Nevertheless, teachers still had some concerns about the identification of gifted students with learning difficulties and expressed a heightened understanding of the challenges involved in effectively catering for the needs of the gifted. Also, some of the teachers chose to attend additional external professional development on gifted education because their awareness and interest in this field had been raised through participation in this study.

Teachers worked to address the special needs of their students. They trialled new strategies to support the selected students, however, this did not necessarily

result in improved academic outcomes in standardised assessments, particularly if the students were easily distracted and unable to work independently. In this regard some teachers indicated that this extra workload added to their stress.

Another positive outcome for teachers was that they could more effectively focus on learning issues rather than student behaviour. Informal observations of the selected students revealed that those who displayed disruptive, teacher-noticeable behaviours at the beginning of the research year, changed to working quietly on whatever activities they were engaged in by the end of the year. However, caution is required in the interpretation of this finding because the students' behaviour may have settled down anyway.

In brief, the outcomes for teachers were mostly positive, namely enhanced awareness and provision for the gifted, as well as improved student behaviour and engagement with learning which enhanced the whole-class learning environment. The negative outcome most frequently reported by teachers concerned the time required for additional preparation of individual programs.

Students

All the selected students achieved writing outcome gains by the end of the research year, and some made substantial gains. For instance, one student was assessed by external markers of the Student Outcome Writing (EasyMark, 1997) test to be at Level 2 Stanine 4 in Term 1 of the research year and when re-assessed in Term 4 was determined to be at Level 3 Stanine 7 (see Appendix 14). Teachers' efforts to assist some of these students focus on organisational and time-management skills appeared to contribute to the gains achieved. Teachers' liaison with other relevant professionals, such as psychologists, vision, speech and occupational therapists, also contributed to the gains achieved by students.

Apart from measurable writing outcome gains, evidence from informal observations and parent feedback confirmed that students experienced growth in personal and writing confidence, as well as appropriate risk-taking behaviour when engaged in writing tasks. However, fixation with correct spelling and sentence formation during the draft stage of the writing process still appeared to constrain some writers. Parents expressed satisfaction with their children's progress, engagement at school and growth in confidence. Some of the selected children

displayed increased appropriate risk-taking behaviour, in both writing and other educational contexts. The finding mentioned in the previous section on outcomes for teachers regarding the improved classroom behaviour of formerly disruptive students, is also relevant here. The students concerned became more positively occupied in class. Furthermore, the children who had been reclusive in the playground at the beginning of the year became more socially confident as the year progressed. Thus positive student outcomes were obtained in both the academic, behavioural and socio-emotional spheres.

The observable writing behaviour of the focus students did not change markedly during the year. As found at the beginning of the year, during the classroom observations of the genre writing lessons (recount, narrative and report), the students continued to be distracted from their writing tasks by other events. Despite this finding, in an assessment context, rather than the 'normal day' classroom observation context, changes in student writing outcomes were apparent. Evidence for these changes came from informal observations, parent feedback, and document searches that ranged from standardised test results to medical and educational specialists' reports.

5.2 Comparison of Findings

Attitude Development

Numerous studies have reported unfavourable community and teacher attitudes towards the gifted (Cramond & Martin, 1987; Gross, 1997; Tannenbaum & Baldwin, 1983). Some Australian studies suggested teachers who have participated in professional development in the field of gifted education will express more positive attitudes towards the gifted after this training (S. M. Cooper, 1999, graduate teachers; Gross, 1994, 1997). Factual information and practical, research based strategies for the identification of, and programming for, the gifted, was provided in the professional development sessions for teachers in the current study. This professional development, along with curriculum and resources support throughout the year, did not result in significant attitude change in the teachers studied. This

finding is contrary to the results obtained by Gross where it was found that "... both teacher in-service and training programs in gifted education can lead to powerful and positive attitudinal changes towards gifted students and their needs" (Gross, 1997, p. 20). A number of reasons are suggested that could account for the results obtained in this research.

Although the teachers' attitudes were already positive at the beginning of the present research, the most likely reason that the study did not obtain the expected gain in attitudinal change relates to sample size. The current research had a sample size of twelve teachers, while in the Gross (1997) study seventy-eight teachers attended the one-day in-service on gifted education and seventy teachers completed the 75 hour Certificate of Gifted Education course at the University of New South Wales. Sample size is thus an important factor to consider when comparing the quantitative results.

A second possible reason for the lack of attitudinal change relates to the timing of the second administration of the attitude scale. In Gross' (1997) study the second scale was administered immediately after the training courses, whereas in the present study, the second administration of the scale was not undertaken until a year later. Different evidence relating to the timing of the second administration of the attitude scale can be drawn from a Western Australian study (Cooper, 1999). This research found limited evidence that secondary teachers, one year after their gifted education training, showed "a medium, positive, attitudinal effect once the cohort became practising teachers and put policy/theory into action, as their attitudes were more positive towards the gifted" (Cooper, 1999, p. 100). However, this positive improvement in teachers' attitudes was from an overall negative attitude toward the gifted to an ambivalent attitude (see Table 4.2). This finding contrasts with the evidence in the present study, which found that teachers' attitudes did not significantly change during the year, however these teachers indicated a positive attitude toward the gifted throughout the study.

Another possible reason that the present study did not obtain the expected attitudinal change may be related to the level of schooling taught. Cooper's (1999) teachers taught at the secondary level, and Gross' (1997, 2003) participants comprised a mixture of primary and secondary teachers, whereas all the teachers in the present study taught at the primary or pre-primary level. The significance of

level of schooling taught and attitude toward the gifted is unknown. Caution is therefore required in these considerations because the teachers in the present study were not only pre-primary/primary teachers but also Montessori teachers.

A fourth reason that a post-test attitudinal change was not observed could relate to the teachers' attitude strength, as a motivational determinant of resistance to change (Eagly & Chaiken, 1993, p. 580). Overall, the Montessori teachers maintained their beliefs about gifted children, their needs and how they should be provided for, throughout the study. These teachers espoused strongly held views and they remained assured of them. This finding, although contrary to the results of earlier studies (Cooper, 1999, re. graduate teachers; Gross, 1997), is not however unusual. Various authors have found that resistance to change is often pervasive and effective (J. Cooper & Stone, 2000; Eagly & Chaiken, 1993). The problematic nature of creating significant attitude change in natural settings is recognised and "the observation that change is not easily accomplished is frequent" (Eagly & Chaiken, 1993, p. 559). It is very difficult to change attitudes that "define membership in important social categories" (J. Cooper & Stone, 2000, p. 238). Other reasons for this resistance to change relate to the function of attitudes in peoples' lives, that is, attitudes provide guidelines which assist decision-making (Eagly & Chaiken, 1993, p. 559).

A further possible reason that attitudes did not appear to change could relate to the sensitivity of the scale to context. The Gagné (1991) scale is the standard form that is widely used and was developed in the North America. However, this study found that the scale was not entirely appropriate for the Australian context. Cooper's (1999, p. 99) research arrived at a similar conclusion. In addition, in the current study, teachers commented on interpretation difficulties for a number of the items in the scale, as they did not seem to apply to a Montessori context. The need for modifications to the scale is discussed in the following section on possible future research directions in this field.

A final possible reason that attitudinal change did not occur could relate to the professional development presented by the researcher of the current study. Gross (1994, 1997, p. 18) conducted research and identified important criteria for gifted education training programs to be successful in achieving positive attitudinal change. The present study attempted to incorporate these criteria. One criterion involved

participants receiving course handouts that included articles published in internationally recognised journals (Gross, 1994, 1997). Participants of the present study were provided with such handouts. Another criterion involved course emphasis on developing special programs for the gifted, together with in-class enrichment for every child (Gross, 1994, 1997). This was included as a component of the professional development provided during the current research. However, one criterion of successful training programs, identified by Gross (1994), that was not possible to include in the present study was having a high profile presenter. This did not occur in the current context because the methodology of the study incorporated action research and collaborative learning. Thus the professional development provided by the researcher in the current study did not meet all the criteria Gross (1994) identified for successful gifted education training programs.

In summary, the present study found that the Montessori teachers did not indicate, after professional development, the expected positive attitudinal change toward gifted students and their needs. A number of possible reasons for the lack of attitudinal change have been discussed. There may be other points contributing to this finding as well. These reasons however, should not be simply considered in isolation of each other, for it is possible that there are overlapping issues that further confound the lack of attitudinal development. Despite the lack of attitudinal change, it remains the case that the teachers in the present study indicated positive attitudes toward the gifted throughout the research. This finding confirms the results of some other recent Australian studies, in which teachers, working in a range of contexts, including: government (public) and independent schools, rural and urban environments, and levels taught (primary, secondary and tertiary) expressed overall positive attitudes toward the gifted (S. M. Cooper, 1999, re. 1996 cohort; Gross, 1997; Plunkett, 2000; S. R. Smith & Chan, 1989; W. Smith & Chan, 1996). Since all these studies, except for Gross (1997) and Cooper (1999), employed researcher-designed survey schedules to determine the teachers' attitudes, detailed comparisons of the results cannot be made.

Provision for the Gifted

Identification

Teachers need to know that a child is gifted, to appropriately cater for their requirements. Such identification is not necessarily an easy matter (Bartak & Fry, 2004). Only children formally identified as gifted, and also experiencing learning difficulties, were included in this study. These children presented with, for instance, either Verbal or Performance scores in the superior range on the WISC-R intelligence test, with a difference of at least 15 points between the Verbal and Performance scores, following Fox and Brody's (1983) suggestion regarding the diagnosis of giftedness and learning disabilities.

As noted in other research, teachers need to be continually aware when reflecting upon the identification of gifted students, that learning difficulties may mask a child's gifts (Fox et al., 1983a; Ivicevic, 2004; Kearney & Gilman, 2004; Liddle & Porath, 2002; Silverman, 2003b). A child's gifts may also be used to mask learning difficulties (Liddle & Porath, 2002; Silverman, 2003b). Perhaps the use of a range of criteria to identify twice-exceptional children, as outlined in the literature review, although still problematic, is the most inclusive process that is currently available. Such criteria include a nomination process, alternate forms of tests, product portfolios, modified administration of tests, full-scale psychoeducational evaluation, and referral for assessments by an occupational therapist, behavioural optometrist and/or speech therapist when indicated by teachers (E. E. Cooper et al., 2004, p. 83; Davis & Rimm, 1998, p. 346). Some teachers in the present research were aware of other students who could be gifted, as determined by criteria other than IQ testing. Furthermore, these students did not fit within the formal conditions suggested by Fox and Brody (1983) and most manifested serious attention difficulties.

To sum up the identification issue, "In some cases then, the intelligence test - the most commonly used instrument for identifying gifted children - may add a handicap to the discovery of giftedness among already disabled children" (Davis & Rimm, 1998, p. 345). Thus the identification of twice-exceptional children remains an issue of concern for the teachers in this study.

Program Provision

Curriculum differentiation is considered to be the basis upon which programs for the gifted can be designed (Dinnocenti, 1998; Farmer, 1996; Gross et al., 2001; Maker & Nielson, 1995; C. A. Tomlinson, 1995; Troxclair, 2000). Five elements of curriculum differentiation were identified, namely, content, process, product, learning environment and the teacher (Maker, 1993; Maker & Nielson, 1995; Renzulli, 1997). A close examination of the types of strategies employed by the teachers in the present study indicate that all these elements of differentiated instruction were discussed by the teachers in the interviews and some were seen in action in the observational contexts. However, this is not to say that any one student benefited from all these forms of curriculum differentiation. The findings of this research also suggest that the learning environment and teacher elements are areas where more attention could be focused in the school. With regard to Renzulli's (1997) fifth element, the teacher, some of the teachers in the current research recognised this and requested further training to better meet the needs of their gifted students.

Other Australian studies on provision for the gifted have found that teachers have a preference for enrichment over acceleration (B. Clark, 1997; Gross, 1993; Gross et al., 2001; S. R. Smith & Chan, 1989; W. Smith & Chan, 1996). Thus the finding in the present study, that suggested a ready acceptance and use of acceleration by teachers of gifted students, were contrary to the evidence of these previous studies. Both the results of the acceleration factor on the attitude scale and the interview data on provision strategies indicated a positive attitude toward acceleration by teachers in the current research. The Montessori primary teachers had gifted children in their classes who experienced subject acceleration in their area of giftedness, as well as several instances of students who had grade-skipped a single year. The structure of the multi-age classes appeared to facilitate the application of both these forms of acceleration, since students worked independently on their own programs.

The selected gifted children in the current research experienced learning difficulties in writing. They were involved in subject acceleration relevant to their gifts, which ranged from reading, to spelling and mathematics. In addition to this

subject acceleration, these students also participated in writing activities, directed by their class teachers, to support their writing difficulties.

The research conducted by Liddle and Porath (2002) suggested that writing difficulties in young gifted children were more common than in the general population. Teachers at the school in the current research were particularly concerned about their gifted students with writing difficulties. However, research has shown that this problem is marked for these children during the primary school years and reaches a maximum around Year 7. As these researchers recommend, other modes of presentation, such as oral reports and assignments completed using a word processor, may be more appropriate for these primary-aged twice-exceptional students (Liddle & Porath, 2002).

Many studies recommend the use of assistive technology to support gifted students with difficulties in writing (Ingleheart, 1998; Liddle & Porath, 2002; Stewart, 2002). The selected students in the present study all experienced opportunities to use computers at school. However, the small number of class computers were in demand by all class members, on a roster basis, so, as was observed, these gifted students often wrote by hand. It is therefore suggested that the special need for these students to access assistive technology more frequently, be recognised.

Writing difficulties in the young gifted could be an indication of other problems, such as a phonological awareness difficulty. Liddle and Porath's (2002) research suggested that this needed to be investigated. Evidence from the McBride-Chang, Manis and Wagner (1996) study also emphasised the importance of phonological awareness in the development of literacy skills. In Munro's (2002) research on reading, a link was drawn between phonemic awareness knowledge and orthographic knowledge. This link may have been observed in the present study. During the classroom observation sessions, students continually made use of their erasers while writing, indicating insecurity about spelling patterns or graphophonic patterns. Phonological awareness tests (Love & Reilly, 1995) were conducted when indicated and it was found that two of the six students required intervention to improve their phonological awareness skills.

An alternative, or even overlapping, interpretation to the frequent eraser-use by gifted students with writing difficulties could relate to a characteristic common to

gifted children, namely perfectionism. The problem of student perfectionism appeared to remain an ongoing issue throughout the study. Other researchers have likewise identified perfectionism as an important issue impacting on many gifted children (Gifted and Talented Children's Association of Western Australia Inc., 2002a, 2002b, 2002c; Kerr, 2002; A. Martin, 2003b). Thus perfectionism appears to require further intervention in the school. Teachers in the present study seemed to need further support regarding strategies to assist gifted students deal with the negative consequences of perfectionism.

Another aspect of learning difficulties in writing may involve neurobiological problems. The specific exercises to improve the vestibular system and visual functions of tracking and binocularity, reported by Kokot (2003), appeared to contribute to improved literacy outcomes for the gifted dyslexic student in that study. Likewise in the present study, nearly all the selected students were found to have neurobiological problems that required intervention by an occupational therapist and/or developmental optometrist. So, when considering strategies to support gifted children with learning difficulties in writing, it seems that neurobiological assessments may be needed to identify any possible weaknesses in this area.

Although the Montessori teachers could name many strategies that were appropriate for the education of the gifted, and indeed they employed new strategies during the year, they also discussed the problems of catering for many different special needs in their classrooms. The teachers indicated that these problems limited the effectiveness of the special programs that were put in place to support gifted students. The teachers in the current study referred, in particular, to the students' difficulty in 'working independently', which is a key component of the Montessori approach to education. It has been observed that young Montessori students, from their earliest days in the Children's House, progressively develop the ability to learn and work independently (Montessori, 1964, 1965, 1984). However, this is not the case for all Montessori students, particularly those with learning difficulties (Pickering, 1998; Pickering & Alegria, 1999). This weakness in 'working independently' was observed to limit the effectiveness of special programs for the gifted in the present study.

Providing individualised programs for the gifted also led to discussions with teachers, both in interviews as well as in informal contexts, about stress from their

workload and emotional commitment to their students' education. Teachers in the present study expressed the view that excessive demands on their time to attend to more administrative duties, the application of the Curriculum Framework (Curriculum Council, 1998) in the Montessori context, along with the necessity to prepare individual programs and associated resources for many students, negatively impacted on overall student learning in their classes. Other studies have also reported teacher stress associated with the teachers' workload (Baird, 1991; Bartak & Fry, 2004; Connell, 1985; Gibson, 2004; Louden, 1987; O'Brien, 1999; Williams, 1991). Teachers in the present study recognised that there was always more that could be done to support special needs children. Associated with this, it was observed that individual teachers at the school found varying degrees of weighting for their work - private life balance, depending on their personal circumstances. Teachers in the current research expressed the view that there were many pressures on their time and that special programs, which were prepared for the gifted, were not necessarily effective.

One area where the present study aligns with other Australian research relates to the need for further training in gifted education. The studies of primary and secondary teachers in New South Wales found there were aspects of giftedness and related provision issues that were not well understood by teachers (S. R. Smith & Chan, 1989; W. Smith & Chan, 1996). Similarly, Plunkett's (2000, p. 41) conclusion relating to teachers in Victoria, that they "were prone to misconceptions and uncertainties in relation to the educational requirements of this group", appears to be equally applicable in the present context. The Montessori teachers expressed confusion about the difference between gifts and strengths, were initially unaware of the importance of provision issues as reflected in their concept maps, and expressed doubts about the effectiveness of their programs for the gifted. At the end of the current research the teachers had unresolved issues about catering for their gifted students. Thus, additional training in the field of gifted education appears to be warranted in the school under consideration, as seems to be the case across Australia.

In brief, teachers in the present study named and employed a range of strategies to provide for the needs of the gifted. These strategies were modified over time, responding to the individual requirements of the students. However, the teachers also discussed a number of issues contributing to the lack of effectiveness of

some of their interventions. Such issues included the identification of all twice exceptional children in their classes, the inability of the students to 'work independently', problems related to student perfectionism, and workload stress. The need for further training in gifted education is thus recommended. Further issues relevant to programs for twice-exceptional students, such as gifted peers and mentors, are discussed in the section on implications for school administration.

Outcomes for Teachers and Students

Outcomes for Teachers

One way of reviewing outcomes for teachers, is to revisit the adapted teacher change model illustrated in Figure 2-2 (see p. 60). This model for effecting teacher change incorporated overlapping sets: professional development, curriculum resources and reflective participation. It was shown to be an accurate representation of the practical, behavioural changes observed in teachers' programs for the gifted.

At the end of research, teachers were more aware about issues related to identification and classroom provision for the gifted. They had contributed to the development of an agreed policy statement that aimed to cater for the needs of gifted children. Furthermore, some teachers requested additional training in the field of gifted education, while others sought training in areas that arose out of heightened awareness of the characteristics of some of their twice-exceptional students, such as perfectionism and the need to develop independent work skills.

Another outcome identified by teachers related to teacher 'stress'. Many of the teachers commented on this issue and used the word 'stress', in a variety of contexts, ranging from the formal interviews to the observations made by the researcher in different settings. Teachers indicated that they felt stressed about their workloads, particularly in relation to the time involved to more effectively cater for gifted children in their classrooms. An additional area of stress arose from the research itself. For the initial interview, at the beginning of the research period, teachers tended to agonise over whether they had said enough, written enough on their concept maps, and overall whether the quality and content was appropriate. However, by the end of the research year, when they completed the second

interview, teachers were more brisk in their responses and, as noted earlier, fewer words were used in the concept maps. Furthermore, the teachers said they were "very busy", were "under pressure" and operating within "tight time constraints". Completing the interviews also generated anxiety for some teachers because they wanted to "support" the research but did not think they had much "worth" contributing. Consequently the researcher had some difficulty scheduling the second set of interviews. The degree to which teacher stress impacted on the outcomes obtained is not clear, but it is important to recognise that it was an issue raised by the teachers themselves.

Outcomes for Students

Evidence from the literature suggests that specific programs, involving curriculum differentiation support gifted students (Gross et al., 2001; Maker & Nielson, 1995; C. A. Tomlinson, 1995). These programs, together with particular teaching strategies, facilitate the process of allowing gifted children to work towards their potential. As a result of these interventions, improved outcomes for students, and teachers, are expected. The individualised programs for the twice-exceptional students involved in the present study incorporated curriculum differentiation, allowing the students to be challenged in their areas of strength while supporting their writing difficulty. Evidence was obtained for improved outcomes for the gifted students participating in the current study. They achieved quantitative and/or qualitative writing outcome gains after individualised modifications to their literacy programs. They wrote longer texts, at a higher standard and/or displayed improved writing confidence.

There is also recognition, in the literature, of the impact of learning difficulties on gifted children, as well as issues relating to lack of motivation and underachievement amongst the gifted, with guidelines to address these problems (Kyung-won, 1990; Richert, 1991; Rimm, 1986; Rimm, Cornale, Manos, & Behrend, 1993; Winebrenner & Berger, 1994). Teachers in the present research attempted to address some of these issues by time-management/organisational modifications to individual programs and liaison with parents and other relevant professionals. However, the findings of the present study suggest that further changes are required in the learning environment to enhance the students' self-regulatory learning skills and address problems related to motor coordination skills, as well as perfectionism.

In the current study it was important to consider not only quantitative data, but also qualitative information when measuring the outcomes for gifted students. Broader, deeper, different understandings about twice exceptional students were obtained from such investigation. As Schultz (2002, p. 193) observed, it is vital to look beyond a narrow specific outcomes approach, that permeates research design, otherwise twice exceptional students may gain the impression that there is something wrong with them, and that we are trying to make them fit with their gifted peers.

Another aspect that needs to be considered to guide the interpretation of student outcomes, relates to the differential perceptions of teachers and students. Research investigating perceptions of provision, challenge and choice in classrooms has found that teachers and students perceive these matters differently (Gentry, Rizza, & Owen, 2002, J. Gray, personal communication, June 1, 2004). Gentry, et al. (2002, p. 145) found "that what teachers report may not be what students actually experience in the classroom". Since explicit student input was not obtained as part of this study, the foregoing evidence suggests the need to employ caution when reporting on student outcomes.

5.2 Summary of Findings

The key findings of the research permit the following conclusions to be drawn from this study. These conclusions are presented with reference to the three research questions.

1. Pre-primary and primary Montessori teachers indicated positive attitudes toward the gifted prior to professional development and after a period of enactment. Their attitudes did not appear to change over time. Compared to other Australian teachers surveyed in previous studies, the Montessori teachers indicated more positive attitudes toward the gifted than Western Australian secondary teachers and less positive attitudes than New South Wales primary and secondary teachers.

2. The teachers made a range of program modifications for their gifted students, employed additional strategies and participated in the development of gifted policy guidelines after staff development. The types of modifications made to gifted

children's programs after professional development appeared to be tailored more to individual student requirements rather than the application of general strategies for the gifted. The teachers also trialled new strategies for gifted students in the circumstances where it appeared that little progress was being achieved.

3. The teachers' awareness of formally identified gifted students in their classes, as well as twice exceptional students, improved after professional development and a period of enactment. However, the teachers expressed the need for further clarification regarding the identification of twice-exceptional students. At the end of the study the teachers' awareness of the needs of the gifted and associated classroom provision issues was enhanced, and they expressed heightened understandings about the challenges involved in effectively catering for the needs of the gifted. Furthermore, the teachers expressed reservations about the effectiveness of some their program modifications for some gifted students. These reservations predominantly related to the students' difficulties with working independently.

A rather negative outcome for teachers was concern about their workload, related to the additional time required for preparation, implementation and evaluation of individual programs for the gifted. On a more positive note, the teachers reported that enhanced classroom provision for the gifted resulted in improved student behaviour and engagement with learning, which enabled the teachers to more effectively focus on learning issues. The gifted students with learning difficulties in writing became more positively occupied in class and socially confident after individualised modifications to their programs.

A further benefit for the gifted students with learning difficulties in writing was that they achieved quantitative and/or qualitative writing outcome gains after individualised modifications to their literacy and/or organisation/time-management programs, in conjunction with parent support and/or consultation with a related professional. In particular these students displayed growth in writing confidence and improvements in appropriate risk-taking behaviour in writing tasks.

5.4 Further Implications of the Findings.

This study has shown that improving teachers' awareness of the needs of gifted students, providing curriculum and resources support to classroom teachers and developing supportive policy directives, appeared to contribute to improved classroom provision, and result in literacy outcome gains for gifted children with learning difficulties in writing. However, the small number of participants in this study means it would be unwise to generalise the foregoing conclusions beyond the particular group of teachers and students involved. The study nevertheless offers additional valuable insights on both the topic of investigation and methodological issues, which may be of use to future researchers in these areas.

School Administration

The findings of the present study identified seven areas of relevance to school administration. These areas relate to the power of policy, the advantage of adopting a whole school approach, the need for further professional development, the benefits of multi-age classes, the need for teacher support, the value of gifted peer links outside the school and the merit of involving mentors.

Policy

As part of the action research - professional development process, the teachers in the present study participated in the development of a gifted policy for the school. They subsequently agreed to the final written policy document addressing the identification and provision needs of gifted children. The study found that these teachers became more aware of their gifted students' needs and gave more attention to appropriate classroom provision. This illustrates the power of policy development and policy implementation within a school. Similarly, Dadds (1995) reported on action research within a school, involving the development of a humanities policy. That author found "that the policy discussion document has led to positive changes in the teaching of humanities" and furthermore, that the policy document was still being used a year later (Dadds, 1995, 40). Thus it is vital that school principals and those in administrative roles recognise that teachers require clear guidelines to enable them to appropriately provide for the gifted. Although this sounds obvious, smaller

independent schools have not necessarily developed their own policies, in contrast to government education bureaucracies that abound with such directives. Gifted policy matters should not be left to individual teachers to consider as they see fit, because the gifted, for various reasons, have been poorly catered for in the past (The Australian Senate, 2001).

Whole School Approach

Another aspect to the development of the gifted policy in the present study, relates to how it drew the school together, enabling it to work as a whole, to some degree. For action research to be effective in a whole school context, a positive relationship between the researcher and the school administration is vital (Wilson, 1996). If action research is undertaken within a school, in a scenario similar to the present study, it is important that the principal or administrators fully support the endeavour, and promote it as a whole school commitment. Otherwise, the outcome could be a series of mini action research cycles, all at different stages in separate classrooms, with no overall cycle drawing everyone together with a common purpose. Likewise, Wilson (1996) maintains the importance of strong leadership, direction and support by a school's administration, arguing that they are needed for successful whole school research projects.

Professional Development

The present study provided some incidental feedback from the teachers on the staff development process that was employed. The linking of staff development theory sessions on a recognised issue of concern with ongoing curriculum and resources support was reported to be beneficial in contributing to positive staff and student outcomes. Other authors support this point of view and present additional strategies for best practice staff development (Hughes, 1991; Mularczyk, 2003; National Board of Employment Education and Training, 1993; Ramsey, 2000; Richardson, 1994b; Williams, 1991).

One issue raised by staff in the current research concerned twice-exceptional students' attention difficulties and poor self-regulatory behaviour. This could be an area for future staff development and action research in the school. Numerous researchers have investigated this issue and provide guidelines for further research (Brown, 2002; Chae, Kim, & Noh, 2003; De Corte, 2002; Warshaw, 2003b; J. Webb

& Latimer, 1993; Willard-Holt, 1999). For example, Burgess (2003) studied children with learning difficulties who experienced attention and concentration problems. Strategies to reduce these difficulties, which were found to be crucial to the learning process, included "teacher modelling, explicit teaching, developing an internal locus of control and specific teaching of intelligent behaviours" (Burgess, 2003, p. 8).

Another aspect of teaching gifted students, highlighted by the present research, was the issue of student perfectionism. Staff requested further training in this area, to assist them to provide more effectively for gifted children. Various researchers have commented on this phenomenon and make suggestions for teachers (Gifted and Talented Children's Association of Western Australia Inc., 2002a, 2002b, 2002c; Kerr, 2002; A. Martin, 2003a, 2003b; Munro, 2002c; K. J. Wood, 2002).

Multi-age Classes

This study showed that intervention to meet the needs of twice-exceptional students could be successfully undertaken in multi-age classes. This result supported the findings of previous research that indicated that multi-age classes could be advantageous in meeting the needs of gifted students, if the teacher was willing to provide appropriate, individualised curriculum differentiation (Lloyd, 1997).

Support for Teachers

Teachers in the current study raised workload concerns related to the provision of individualised programs for the gifted. They recognised that their gifted students needed special programs but had some reservations about the effectiveness of these programs. These reservations related, in part, to having enough time and expertise to prepare special programs. The teachers argued that the school administrators needed to provide them with support if they are to cater more effectively for the gifted, in line with the policy directives. They suggested support could be provided by the provision of additional time, time to work with targeted students, or prepare gifted programs and resources, or attend relevant professional development.

A further aspect of this teacher support issue relates to the Collaborative Problem Solving Team meetings held at the beginning of the year to review the

needs of every child in the class. Several of the teachers mentioned during the interview process that it would be useful to repeat these particular meetings throughout the year, say every term. Teachers stated that it was vital to review progress and to set short-term goals. This would be an important follow-up action, because staff recognised that in the day-to-day pressure of teaching, the undemanding gifted child may not be given the attention needed. Without this type of support, teacher workloads may result in the gifted being neglected because of other teaching priorities.

Gifted Peers

Since the school under consideration is a small school, in some years gifted students have very few gifted peers with whom they can interact. As the literature has suggested, this can be a problem for gifted children in this situation (Cohen, Duncan, & Cohen, 1994; Johnsen & Ryser, 1996; Maker, 1993). Therefore, in the context of a Montessori school, or a small school, it would be valuable for gifted students to have the opportunity to study and mix socially with gifted children from other schools. It is therefore recommended that school administrators explore ways of developing programs that encourage peer links between the gifted, outside the school community, as was achieved in the Varley and Vialle (1994) initiative between five public schools.

Mentors for the Gifted

During the current research, mentors participated in various gifted programs at the school. The mentors were drawn from contacts within the school community, professional organisations associated with the gifted, and volunteer organisations. The teachers reported that this approach was valuable, not only enhancing the students' motivation but also providing essential links with real world issues. Providing mentors in the areas of the gifted children's interests is a known strategy for supporting gifted children but it is not employed enough (Bernal, 2003; Gross, 1993). Thus, another implication for school administration involves supporting teachers in the development of mentor programs for the gifted.

Teacher Education

The findings of the present study have implications for those responsible for the education of gifted children, both in the school professional development context and the university training of teachers. Two aspects of teacher education are considered: attitude development and approaches to provision for the gifted.

Attitude Development

Changing and developing teacher attitudes toward the gifted is extremely important in the field of gifted education training because of the prevalence of non-supportive community attitudes toward the gifted (The Australian Senate, 2001). Furthermore, attitude development is sometimes a neglected aspect of teacher education, with courses often concerned with the transmission of content, with little focus given to attitude development (Wethereld, 2003). To enhance teacher attitudes towards the gifted, Gross (1997) outlined six aspects for providing successful training programs that elicit positive attitude changes. The characteristics of effective teachers of the gifted, their background and personality, also needs to be considered (Mills, 2003). Newhouse-Maiden and Williams (1996, p. 8) studied undergraduate training in gifted education and found "specialised knowledge on the gifted" and the student teachers' "active involvement in enrichment activities" provided a sound basis for innovation in the classroom. Such research provided background information relevant to the attitude development of teachers in the present study.

The professional development program, the ongoing resources and curriculum support, and involvement in policy development, in which the teachers in the current research participated, did not result in enhanced attitudes toward the gifted. Evidence from the current research suggested that the teachers' attitude strength might be an issue in resistance to change. The teachers did not significantly change their strongly held views about the gifted, throughout the study. This finding agreed with other research that suggested attitude development was a very complex field of investigation (J. Cooper & Stone, 2000; Eagly & Chaiken, 1993). Thus further research on the attitude development of teachers working with gifted children is recommended. Such future research is discussed in the final section of this chapter, in the context of level of schooling taught.

Approaches to Provision for the Gifted

Teachers in this study identified workload concerns in relation to their difficulties in providing for the gifted. They indicated that they required further training and support to provide for the gifted. The teachers wanted information about proven strategies that are time-efficient and will work in their classrooms. They requested more involvement with 'real' teachers of the gifted, such as teachers from a professional association for teachers of the gifted (Sunderland, 2004), suggesting that such teachers could provide more workable, practical approaches for real-life classroom contexts, in contrast to professional development that emphasised information/content transmission.

Methodological Issues

This section will discuss some of the methodological issues that emerged from the data collection and analysis of results in the present study. Discussion will focus on the theoretical framework, the action research method, the attitude scale and finally, a review of the limitations to the study.

Theoretical Framework

A conceptualisation of the relationship between teachers and their gifted students was presented in the theoretical framework outlined in Figure 1-1 (see p. 7). The findings of this study have pointed to teachers' concerns about their workloads and the additional effort involved in provision for the gifted. Related to this is the teachers' need for support to enable them to prepare special programs for their gifted students. These issues are important variables that were not incorporated into the original theoretical framework.

Action Research

The literature on action research suggested that this form of research proceeds with each stage following the other, and each cycle building on the events of the previous cycle (Cherry, 1999; Grant, 2000; Grundy, 1995; J. Webb, 2000). This conceptualisation of action research was presented in Figure 2-1. The implications of the findings of this study for this conceptualisation are discussed below, together with suggested modifications that flow from them.

Experiences during this study pointed to a series of mini action research cycles operating for each class, rather than one action research cycle being relevant to the whole school. Admittedly, there was one whole school action research cycle relating to the development of the Whole Child Policy, with different teachers contributing to its evolving form. However, not unexpectedly, different teachers trialled new strategies, developed individual programs, and so on, all at different rates, times and degrees of depth and creativity. Thus it is somewhat superficial to imply that after the initial professional development session, all the teachers were working together on the same cycle, with common objectives and priorities. This suggests that the original action research diagram did not adequately represent the process of action research as it evolved in the school. In a recent work Kemmis and McTaggart (2000, p. 595) indicated that this could occur:

In reality, the process may not be as neat as the spiral of self-contained cycles of planning, acting and observing, and reflecting suggests. The stages overlap, the initial plans quickly become obsolete ... In reality, the process is likely to be more fluid, open, and responsive.

Furthermore, these authors maintained that action research is best conceived in collaborative terms, but conceded that it is "frequently a solitary process of systematic self-reflection" (Kemmis & McTaggart, 2000, p. 595).

Consequently, a reconceptualisation of the action research cycle for the current study is therefore offered. Instead of one action research cycle, as shown in Figure 2.1 (see p. 56), there is now the policy cycle drawing the staff together, with all the teachers and the researcher working at different stages on other mini action research cycles. These modifications to the action research model may be relevant in other contexts where participants have a high degree of autonomy in the application of particular guidelines or policies (see Appendix 15).

Another issue related to the action research methodology concerns the challenge to democratise research, that is, make community stakeholders in research "an integral part of the knowledge-generation and evaluation processes", along with the university researcher/s (Greenwood & Levin, 2000, p. 103). This is a growing issue in the research community (Dobozy, 2002, 2004; Greenwood & Levin, 2000; Lather, 1991a, 1991b; Scheurich, 1997; Tripp, 1999, 2001). Within the considerable constraint of teachers' time to participate in research, attention could be directed

towards achieving a higher degree of teacher "collaboration", in Tripp's (1999) terms, in school-based research.

Case Study

The literature on case study methodology suggested there were a number benefits and limitations with this type of investigation (Cherry, 1999; Stake, 1995, 2000a). Although the findings from the present study are not generalisable, the resultant information provides a template against which other Montessori schools and teachers of MAG classes can reflect on their own attitudes toward the gifted and associated provision issues.

Attitude Scale

The use of the "Opinions about the gifted and their education" attitude scale (Gagné, 1991) was recommended by experts in the field. This study revealed a number of limitations to this scale in the Western Australian context in which it was employed. Wording and interpretation difficulties of various items in the scale were identified. Most of the respondents in the present study stated that particular items did not 'make sense' in a Montessori school. The issues contributing to these interpretation problems ranged from the respondents' philosophical perspectives about Montessori education, the Western Australian educational context, Australian social values and differences in personal points of view.

Limitations

The size of the teacher/student sample is the principal limitation of this study. The small number of participants means that the results are not generalisable beyond the target population studied. Related to this issue is the Montessori context in which the study was conducted, that is, the results are not generalisable to other contexts. However, the Montessori context is both a strength and a limitation, in that research in this context has not been previously undertaken and it can highlight issues in similar situations. Another limitation of the present study involved the attitude scale that was employed. It was found that some items were not applicable to the Montessori and Australian contexts. Other minor limitations were outlined in the chapter on methodology; however, the use of triangulation in the design of the study

sought to minimise the effect of these issues. Finally, given the scope of Masters level research, further feedback from parents and children could not be included.

5.5 Implications for Future Research

Emerging from the outcomes of the present study and the relevant literature, two areas are raised as warranting further investigation: provision for twice-exceptional students and teachers' attitudes toward the gifted. Educational provision for twice-exceptional children is complicated by the finding that these students' gifts may be masked by their learning difficulties and alternatively, their giftedness may mask their difficulties (Warshaw, 2003a). So, an initial issue in classroom provision for these gifted children is their identification as twice-exceptional students (Ivicevic, 2004). Some of these students have not been identified as gifted, yet they manifest many of the characteristics of the gifted and they have been identified as having learning difficulties. Furthermore, educators in gifted education frequently do not have appropriate diagnostic tools required for analysing the needs of these children (Munro, 2002a). Evidence from the present study suggested that these identification issues, although improved, remained a challenge. Therefore further research into the identification of these twice-exceptional children is vital to ensure appropriate classroom provision.

The literature outlined specific programs, involving curriculum differentiation and specific teaching strategies, which would support gifted students in the classroom. Further investigation of the effectiveness of these programs, as they are implemented in the Australian context, is needed. For instance, such research could be linked with current curriculum documents. In Western Australia for example, the *Curriculum Framework* (Curriculum Council, 1998), has been developed as an inclusive educational framework for all Western Australian students. This framework and associated progress maps aim to provide teachers with directives to enhance opportunities for students to achieve outcomes at increasing levels of complexity (Department of Education and Training, 2003). Future longitudinal research could be undertaken to investigate the effectiveness of programs and

strategies for the gifted, in conjunction with these curriculum documents, in actually meeting the needs of twice-exceptional children.

Another aspect of future research into provision for the gifted relates to long term outcomes for twice-exceptional children. Other studies have explored the educational history and careers of gifted students (Kerr, 2002; Newhouse-Maiden, 2002; Piirto, 1994), but there has been no documentation of this in a Montessori context. Although the present study included information on student literacy outcomes over a limited time period, a larger study of gifted children, incorporating a wider age range, in a number of Montessori schools could be undertaken, to determine optimum provision and outcomes for all gifted students, including those who are twice-exceptional.

Teacher attitudes toward the gifted is another area that warrants further research. The findings of the current study suggested the need for additional Australian data, incorporating larger samples across states and systems. While this study provided an indication of the attitudes of teachers in one small independent Western Australian Montessori school, it would be of interest to widen the study to a range of schools, including Montessori and government schools.

The analysis of the attitude scale results also suggested a difference in attitude toward the gifted on a state basis in Australia. New South Wales teachers appeared to have more positive attitudes toward the gifted than Western Australian teachers. This issue warrants further investigation to determine if this observation is significant, and whether it is a result of differences in teacher preparation and/or teacher professional development.

Investigation into the level of schooling taught and teachers' attitudes toward the gifted is also needed. The present study revealed confounding Australian data on the level of schooling taught and teachers' attitudes toward the gifted. Further research in this area could clarify this issue, thereby providing more accurate information for those preparing teacher-training courses. If there is a significant difference between level of schooling taught and attitude toward the gifted, then the attitudinal component of such courses could be designed to target primary and secondary teachers differentially. Another aspect of level of schooling taught and teachers' attitudes toward the gifted that could be studied involves looking at teachers' attitudes and relating these to current practice. This could possibly

incorporate a longitudinal study to determine in more detail teachers' attitudes and how they cater for their gifted students, and outcomes over time.

If future research into attitudes toward the gifted is undertaken there is a need for the development of a modified attitude scale. A number of limitations to the "Opinions about the gifted and their education" attitude scale (Gagné, 1991) were identified in this and other Australian research. Thus, any future research on attitude needs to develop a scale appropriate to the Australian educational context. This means that the wording of the items takes into account the variety of educational contexts that operate in Australia, in addition to possible cultural differences that may impact on the interpretation of items by teachers working in countries other than the United States of America and Canada.

5.6 Conclusions

The current research found that Montessori teachers' attitudes toward the gifted were positive. Although professional development in gifted education did not change the teachers' attitudes, they made modifications to their twice-exceptional students' programs to address individual requirements. The programs were framed around each child's gifts and interests, while catering for specific learning difficulties. Both the teachers and students experienced positive outcomes from these actions. By undertaking thorough assessment and identification of areas of exceptionality, then planning and teaching to the needs of the whole child, the creation of an improved learning environment for these twice-exceptional children was achieved. The present study also emphasised the need for pre-service teachers and teachers in the field to have more training in the identification of twice-exceptional children and appropriate educational provision for these students.

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APPENDICES

Appendix 1: Teacher Attitude Scale

Opinions About the Gifted and Their Education

The following statements concern gifted children and their education; they were taken from newspaper articles, books and other sources. I would like to know the extent of your agreement or disagreement with each of them. There are no correct or incorrect answers. Please, feel free to express your personal opinion.

Use the scale below to give your opinion.

Circle beside each statement the number which best represents your opinion.

Answer as spontaneously as possible.

Please answer all questions.

Use answer 3 as little as possible.

SCALE: 1=totally disagree; 2=partially disagree; 3=undecided; 4=partially agree;

5=totally agree.

- | | |
|--|-----------|
| 1. Our schools should offer special education services for the gifted. | 1 2 3 4 5 |
| 2. The best way to meet the needs of the gifted is to put them in special classes. | 1 2 3 4 5 |
| 3. Children with difficulties have the most need of special education services. | 1 2 3 4 5 |
| 4. Special programs for gifted children have the drawback of creating elitism. | 1 2 3 4 5 |
| 5. Special education services for the gifted are a mark of privilege. | 1 2 3 4 5 |
| 6. When the gifted are put in special classes, the other children feel devalued. | 1 2 3 4 5 |
| 7. Most gifted children who skip a grade have difficulties in their social adjustment to a group of older students. | 1 2 3 4 5 |
| 8. It is more damaging for a gifted child to waste time in class than to adapt to skipping a grade. | 1 2 3 4 5 |
| 9. Gifted children are often bored in school. | 1 2 3 4 5 |
| 10. Children who skip a grade are often pressured to do so by their parents. | 1 2 3 4 5 |
| 11. The gifted waste their time in regular classes. | 1 2 3 4 5 |
| 12. We have a greater moral responsibility to give special help to children with difficulties than to gifted children. | 1 2 3 4 5 |
| 13. Gifted persons are a valuable resource for our society. | 1 2 3 4 5 |
| 14. The special education needs of the gifted are too often ignored in our schools. | 1 2 3 4 5 |
| 15. The gifted need special attention in order to fully develop their talents. | 1 2 3 4 5 |
| 16. Our schools are already adequate in meeting the needs of the gifted. | 1 2 3 4 5 |

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SCALE: 1=totally disagree; 2=partially disagree; 3=undecided; 4=partially agree;
5=totally agree.

- | | |
|---|-----------|
| 17. I would very much like to be considered a gifted person. | 1 2 3 4 5 |
| 18. *It is parents who have major responsibility for helping gifted children develop their talents. | 1 2 3 4 5 |
| 19. A child who has been identified as gifted has more difficulty in making friends. | 1 2 3 4 5 |
| 20. Gifted children should be left in regular classes, since they serve as an intellectual stimulant for the other children. | 1 2 3 4 5 |
| 21. By separating students into gifted and other groups, we increase the labelling of children as strong-weak, good-less good, etc. | 1 2 3 4 5 |
| 22. Some teachers feel their authority threatened by gifted children. | 1 2 3 4 5 |
| 23. The gifted are already favoured in our schools. | 1 2 3 4 5 |
| 24. In order to progress, a society must develop the talents of gifted individuals to a maximum. | 1 2 3 4 5 |
| 25. By offering special education services to the gifted we prepare the future members of a dominant class. | 1 2 3 4 5 |
| 26. Tax-payers should not have to pay for special education for the minority of children who are gifted. | 1 2 3 4 5 |
| 27. Average children are the major resource of our society; so, they should be the focus of our attention. | 1 2 3 4 5 |
| 28. Gifted children might become vain or egotistical if they are given special attention. | 1 2 3 4 5 |
| 29. When skipping a grade, gifted students miss important ideas (they have "holes" in their knowledge). | 1 2 3 4 5 |
| 30. Since we invest supplementary funds for children with difficulties, we should do the same for the gifted. | 1 2 3 4 5 |
| 31. Often, gifted children are rejected because people are envious of them. | 1 2 3 4 5 |
| 32. The regular school program stifles the intellectual curiosity of gifted children. | 1 2 3 4 5 |
| 33. The leaders of tomorrow's society will come mostly from the gifted of today. | 1 2 3 4 5 |
| 34. A greater number of gifted children should be allowed to skip a grade. | 1 2 3 4 5 |

Thank you very much for your help in this research project.

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Scoring procedure for the questionnaire

"Opinions About the Gifted and Their Education"

Instructions: Transfer your answers from the questionnaire to the corresponding spaces below, taking care to invert answers (5=1; 4=2; etc.) to items within brackets. Then do the requested computations to obtain totals and means.

Interpretation guidelines: Means below 2.00 usually indicate a very negative attitude, while means above 4.00 have the opposite meaning. Means between 2.75 and 3.25 may be interpreted as reflecting an ambivalent attitude. Remember that the above interpretations are valid only for individual scores, not for group scores who have much smaller standard deviations.

		<u>Totals</u>	<u>Means</u>
A.	Answer: _____ Items > 1 9 11 14 15 24 30 32	_____ / 8 =	_____
B.	Answer: _____ Items > [3] [4] [5][12][16][18][23][26][27][28]	_____ / 10 =	_____
C.	Answer: _____ Items > 13 17 [25] 33	_____ / 4 =	_____
D.	Answer: _____ Items > 19 22 31	_____ / 3 =	_____
E.	Answer: _____ Items > 2 [6] [20][21]	_____ / 4 =	_____
F.	Answer: _____ Items > [7] 8 [10][29] 34	_____ / 5 =	_____
Total score (Sum of A to F)		_____ / 34 =	_____

Titles of Sections

- A. Needs and support (Needs of gifted children and support for special services).
- B. Level of opposition (Objections based on ideology and priorities).
- C. Social value (Social usefulness of gifted persons in society).
- D. Rejection (Isolation of gifted persons by others in the immediate environment).
- E. Ability grouping (Attitudes towards special homogeneous groups, classes, schools).
- F. Acceleration (Attitudes towards accelerative enrichment).

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Appendix 2: Program Strategies for the Gifted in a Montessori Context

Program Strategies for the Gifted in a Montessori Context

Enrichment, extension, acceleration and developing critical thinking skills are program strategies that will challenge and extend understandings for the gifted. Within these strategies there are many approaches that are compatible with the Montessori environment that may be adopted, for example:

- Bloom's "Taxonomy of Educational Objectives" (Bloom, Engelhart, Furst, Hill, & Kratwohl, 1956) can be cross-classified with a Multiple Intelligences model. Use Bloom's 'Thinking Garden Chart' (Lewis, 2000; McGrath & Noble, 1995) and Gardner's 'Multiple Intelligences Chart' (Lewis, 2000).
- Strategies from Betts' "Autonomous Learner" model (Maker & Nielson, 1995) link well with the Montessori notion of independence.
- Extending thinking skills can also be achieved by the use of:
 - "Montessori Schools Thinking Skills Checklist" (Pears, 1996a).
 - "STARPower Teaching and Learning Strategic Planner" (Pears, 1999).
 - "Thinking Skills, Learning Process and Technology" ideas (L. Clark, 1999).
 - 'Mind power' techniques, such as de Bono's 'Six Hat Thinking' (De Bono, 1995), the 'Pluses-Minuses-Interesting Ideas, PMI, Chart' (Lewis, 2000) and "TAGS programming ideas" (Education Department of Western Australia, 1995).
- Considering moral development and moral responsibility issues (Gross, 1993, p. 251; Gruber, 1985; Horowitz & O'Brien, 1985; Pickering, 1999; Popov, Popov, & Kavelin, 1995).

Appendix 3: Teachers' Interview I

QUESTIONS FOR TEACHERS' INTERVIEW I

Introduction

Thank you for agreeing to take part in this interview. As you are aware I'm undertaking my Masters study looking at gifted education.

Q 1 - Definition

Using a concept map show your conception of 'giftedness'.

Q 2

How many students in your class have been formally identified as gifted?

A

Q 3 - Identification

How were these gifted students identified?

A

Q 4

Do you think there are any students in your class who are gifted but have not yet been formally identified?

A

Q 5

Do you think there are any gifted underachievers in your class?

A

Q 6

Who are your gifted underachievers in your class?

A

Q 7

Do any of your gifted students also have learning difficulties?

A

Q 8

Who are your gifted students with learning difficulties?

A

Q 9

What specific difficulties do they have?

A

Q 10 - Provision

Tell me about what you do in your classroom for gifted children.

Please explain in detail, for example, how often does (insert child's name) do (insert teacher's strategies/approaches)?

Q 11

Do you think these strategies/approaches work well?

A

Q 12 - Policy

How do you feel about the school's current approach to the gifted and talented?

Elaborate on response.

A

Q 13

Do you think the school's current gifted and talented approach works? Elaborate on response.

A

Q 14

Is there anything you would like to add regarding gifted education at the school, classroom provision for the gifted including those with learning difficulties, or anything else on this subject? Any comments?

A

Conclusion

Thank you for participating. I really appreciate your making this time available to me. As you're aware I've tape recorded this interview. I'll be transcribing it and when I do I'll give you a copy for you to check that I have recorded your responses correctly. I'm interviewing other teachers in this study because I'm hoping to develop a clear picture of the situation for the gifted and talented in the school by ascertaining different points of view. This is going to be featured in my Masters thesis, maintaining your confidentiality of course, so once again thanks for your support.

Appendix 4: Teachers' Interview II

QUESTIONS FOR TEACHERS' INTERVIEW II

Introduction

Thank you for agreeing to take part in this follow-up interview. As you are aware I'm undertaking my Masters study looking at gifted education.

Q 1 - Definition

Using a concept map show your conception of 'giftedness'.

Q 2

How many students in your class have been formally identified as gifted?

A

Q 3 - Identification

How were these gifted students identified?

A

Q 4

Do you think there are any students in your class who are gifted but have not yet been formally identified?

A

Q 5

Do you think there are any gifted underachievers in your class?

A

Q 6

Who are your gifted underachievers in your class?

A

Q 7

Do any of your gifted students also have learning difficulties?

A

Q 8

Who are your gifted students with learning difficulties?

A

Q 9

What specific difficulties do they have?

A

Q 10 - Provision

- Tell me about what you do in your classroom for gifted children. Please explain in detail, for example, how often does (insert child's name) do (insert teacher's strategies/approaches)?

A

Q 11

Do you think these strategies/approaches work well? Prompt: How well do these strategies work for particular children?

A

Q 12 - Policy

What are your thoughts on the school's new policy on gifted and talented? Elaborate on response.

A

Q 13

Do you think the school's new policy on gifted and talented works? Prompt: Can it be improved?

A

Q 14

What do you think about the impact of the *Curriculum Framework* on the implementation of the Montessori curriculum? Elaborate on response.

A

Q 15

What do you think about the relationship between the *Curriculum Framework* and the implementation of the school's new policy on gifted and talented? Elaborate on response.

A

Q 16 - Training

During your Montessori teacher training, did you have any specific instruction in gifted education theories, methods and strategies? Elaborate on response.

A

Q 17

During your State teacher training, did you have any specific instruction in gifted education theories, methods and strategies? Elaborate on response.

A

Q 18

What professional development sessions, specifically on gifted education issues, have you attended since graduation as a teacher? Elaborate on response.

A

Q 19 (If 'yes' to Q 18)

With reference to the professional development session/s mentioned in the previous question, how useful was/were the session/s, in terms of subsequent application of the PD in your own classroom context? Elaborate on response.

A

Q 20

What are your thoughts on the professional development on gifted education and follow-up support that has taken place at this school over the last year? Prompt: What do you remember from the PD? What information, strategies, etc. have you used in the classroom from this PD?

A

Q 21

Is there anything you would like to add regarding our gifted policy, classroom provision for the gifted including those with learning difficulties, or anything else on this subject? Any comments?

A

Conclusion

Thank you for participating. I really appreciate your making this time available to me. As you're aware I've tape recorded this interview. I'll be transcribing it and when I do I'll give you a copy for you to check that I have recorded your responses correctly. I'm interviewing other teachers in this study because I'm hoping to develop a clear picture of the situation for the gifted and talented in the school by ascertaining different points of view. This is going to be featured in my Masters thesis, maintaining your confidentiality of course, so once again thanks for your support.

Appendix 5: Observation Guidelines

Observation Guidelines

The following observation guidelines for the proposed research have been adapted from Stake's (1995, p. 52) principles for doing a field observation case study:

1. Anticipation:

Identify the cases.

Define boundaries of the cases.

Review background information on each case study student.

Consider existing hypotheses or issues.

Anticipate spaces, persons, issues, and attributes to be observed.

Define role of observer on site.

Work out record-keeping and coding systems.

Arrange observation times and conditions with class teacher.

Discuss need for drafts to be reviewed to validate observations.

Researcher to reflect in journal.

2. First Observation - Gather and Validate Data:

Make observations, recording data comprehensively.

Select vignettes.

Collect copies of work samples.

Classify raw data and begin making interpretations.

Discuss observations with class teacher, academic colleagues, etc.

Researcher to reflect in journal.

3. Developing Conceptualisation:

Rework priorities for attributes, issues, problems, etc.

Reconsider issues or theoretical structure to guide data gathering.

Sketch plans for final report.

Identify the possible "multiple realities" regarding how different people see things differently.

Allocate attention to different "realities".

Researcher to reflect in journal.

4. Further Preparation for Observation:

Redefine boundaries of the cases.

Review background information on each case study student.

Consider where the case study story is incomplete.

Reconsider existing hypotheses or issues.

Anticipate spaces, persons, issues, and attributes to be observed.

Redefine role of observer on site.

Work out record-keeping and coding systems.

Arrange observation times and conditions with class teacher.

Discuss need for drafts to be reviewed to validate observations.

Researcher to reflect in journal.

5. Subsequent Observations - Gather and Validate Data:

Make observations, recording data comprehensively.

Select vignettes.

Collect copies of work samples.

Classify raw data and add to previous interpretations.

Reconsider possible "multiple realities".

Discuss observations with class teacher, academic colleagues, etc.

Researcher to reflect in journal.

6. Analysis of Data and Further Development of Conceptualisation:

Review raw data under various possible interpretations.

Search for patterns in the data.

Look for linkages between the PD, curriculum and resource developments, and

outcomes.

Draw tentative conclusions.

Review data and deliberately look for disconfirmation of findings.

Researcher to reflect in journal.

Organise final report.

7. Prepare Report to Provide Audience Understanding:

Describe setting where the observation was undertaken.

Draft report and materials for audience use.

Test report and materials on representative members of audience.

Assist audience discern typicality and relevance of situation as base for generalisation.

Discuss report with a wide range of people.

Researcher to reflect in journal.

Revise, complete and disseminate report.

Appendix 6: Letter to the Principal and Chairperson of the Management Committee

September 2002

Dear Principal / Chairperson of the Management Committee

I am a Master of Education student at Edith Cowan University and am seeking your assistance for a research project on catering for children with special needs. This study will investigate children's individual needs from a developmental extension point of view, and will be set in the context of the Multiple Intelligences approach and the Virtues Project, both of which are currently in use at the school. From a Multiple Intelligences perspective I will be examining the children's strengths and weaknesses in the different intelligences. Within the Virtues program, the 'virtues' of excellence, self-discipline, taking responsibility, completing a job well and perseverance, will be encouraged.

This research aims to provide current information about the education of special needs students. There are two aspects to the study, a staff level and a student level. Specifically, at the staff level, I want to investigate how I can improve the quality of my teaching practice in this field. Furthermore, working as a team member with the staff, I intend to explore how staff professional development on special needs education influences teacher attitudes, understandings and classroom provision. It is proposed that the research will be able to clarify the current situation and the outcomes of the professional development in terms of policy development, curriculum planning and classroom practices. This action research will entail staff professional development on special needs education, with teacher input via participation in the professional development process, interviews and observation sessions.

At the student level, case studies will be conducted, involving only two students in the school. The aim will be to identify and describe the influences of staff professional development and policy formation on a very small number of students. The confidentiality of these students will be maintained, as these students will not be identified in the school community. This arrangement will be possible because I am a staff member and work with/have contact with all the children in the school, in my role as Developmental Extension and Support Co-ordinator. The case studies will include a review of the students' past records, classroom observations and student feedback on programs they have been involved in. This process will also incorporate interviews with two parents, to obtain their points of view on their children's reactions to the programs.

Please be assured that teachers' comments, parents' feedback and students' input will be held in the strictest confidence. Furthermore, the results of this research will not identify any teachers, parents or students, or the school itself.

Any questions regarding the research project may be directed to myself on ([REDACTED]) or via email at [REDACTED]. If you have any comments about the project or would like to talk to an independent person, you may contact Dr Tony Fetherston at Edith Cowan University on (08) 9370 6373.

Thank you for taking the time to read this letter and your anticipated support for this research project.

Sincerely

Elaine Lewis
M. Ed. Student
Edith Cowan University

Appendix 7: Letter to Class Teachers and Other Staff

September 2002

Dear Teacher / Specialist Teacher / Teacher Assistant

I am a Master of Education student at Edith Cowan University and am seeking your assistance for a research project on catering for children with special needs. This study will investigate children's individual needs from a developmental extension point of view, and will be set in the context of the Multiple Intelligences approach and the Virtues Project, both of which are currently in use at the school. From a Multiple Intelligences perspective I will be examining the children's strengths and weaknesses in the different intelligences. Within the Virtues program, the 'virtues' of excellence, self-discipline, taking responsibility, completing a job well and perseverance, will be encouraged.

This research aims to provide current information about the education of special needs students. There are two aspects to the study, a staff level and a student level. Specifically, at the staff level, I want to investigate how I can improve the quality of my teaching practice in this field. Furthermore, working as a team member with the staff, I intend to explore how staff professional development on special needs education influences teacher attitudes, understandings and classroom provision. It is proposed that the research will be able to clarify the current situation and the outcomes of the professional development in terms of policy development, curriculum planning and classroom practices. This action research will entail staff professional development on special needs education, with teacher input via participation in the professional development process, interviews and observation sessions.

At the student level, case studies will be conducted, involving only two students in the school. The aim will be to identify and describe the influences of staff professional development and policy formation on a very small number of students. The confidentiality of these students will be maintained, as these students will not be identified in the school community. This arrangement will be possible because I am a staff member and work with/have contact with all the children in the school, in my role as Developmental Extension and Support Co-ordinator. The case studies will include a review of the students' past records, classroom observations and student feedback on programs they have been involved in. This process will also incorporate interviews with two parents, to obtain their points of view on their children's reactions to the programs.

Please be assured that teachers' comments, parents' feedback and students' input will be held in the strictest confidence. Furthermore, the results of this research will not identify any teachers, parents or students, or the school itself.

Any questions regarding the research project may be directed to myself on [REDACTED] or via email at: [REDACTED]. If you have any comments about the project or would like to talk to an independent person, you may speak with the school Principal, or contact Dr Tony Fetherston at Edith Cowan University on (08) 9370 6373.

Thank you for taking the time to read this letter and your anticipated support for this research project.

Sincerely



Elaine Lewis
M. Ed. Student
Edith Cowan University

Appendix 8: Letter to Parents

16 September 2002.

Dear Parent

I am a Master of Education student at Edith Cowan University and am seeking your assistance for a research project on catering for children with special needs. This study will investigate children's needs from a developmental extension point of view, and will be set in the context of the Multiple Intelligences approach and the Virtues Project, both of which are currently in use at the school.

From a Multiple Intelligences perspective I will be examining the children's strengths and weaknesses in the different intelligences, for instance, students who may be excellent in maths but have some difficulty in literacy. Within the Virtues program, the 'virtues' of excellence, self-discipline, taking responsibility, completing a job well and perseverance, will be encouraged.

The research aims to provide current information about the education of special needs students. A large part of the research will be at the staff level, focusing on policy development, curriculum planning and classroom practices. Specifically, I want to investigate how I can improve the quality of my teaching practice in this field. In addition, two case studies will be conducted, involving two students in the school. The case studies will include a review of the students' past records, classroom observations and student feedback on programs they have been involved in. This process will also incorporate talking with the two students' parents, to obtain their points of view on their children's reactions to the programs.

The confidentiality of all students in the school community will be maintained. This arrangement will be possible because I am a staff member and work with/ have contact with all the children in the school, in my role as Developmental Extension and Support Co-ordinator. Please be assured that teachers' comments, parents' feedback and students' input will be held in the strictest confidence. Furthermore, the results of this research will not identify any teachers, parents or students, or the school itself.

Any questions regarding the research project may be directed to myself on [REDACTED] or via email at: [REDACTED]. If you have any comments about the project or would like to talk to an independent person, you may speak with Wendy, or contact Dr Tony Fetherston at Edith Cowan University on (08) 9370 6373.

Thank you for taking the time to read this letter and your anticipated support for this research project.

Sincerely

Elaine Lewis

Appendix 9:Statement of Disclosure and Informed Consent for Teachers

Dear [Name of Teacher]

I am a Master of Education student at Edith Cowan University and am seeking your assistance in a research project on educational provision for special needs students in your school. This project aims to provide current information about the education of special needs students. You have indicated that you would be willing to participate in this action research through the professional development process, interviews and classroom observation sessions of the case study students.

During the research year it is intended that there will be ten hours of professional development, two fifteen minute attitude scales to complete and two half-hour interviews, as well as ten hours of observation in your classroom if your class includes any of the case study students. It is hoped that participants will be able to gain new and specific information about issues involved in special needs education, as well as strategies appropriate to the education of special needs students in their classes. The professional development sessions and interviews will be audio-recorded. Please be assured that your responses will be held in the strictest confidence and the results of this research will not identify any teachers, parents, students or the school itself.

If you are willing to participate in these activities please complete the enclosed statement of consent and return it in the envelope provided. I will contact you to arrange a mutually convenient time for the interviews and classroom observations.

Any questions regarding the research project may be directed to myself on [redacted] or via email at: [redacted]. If you have any comments about the project or would like to talk to an independent person, you may speak with the Principal of the school, or contact Dr Tony Fetherston at Edith Cowan University on (08) 9370 6373.

Thank you for taking the time to read this letter and your anticipated participation in this research project.

Sincerely

Elaine Lewis
M. Ed. Student, Edith Cowan University

CONSENT FORM Research for Special Needs Students

I have read the information above and any questions I have asked have been answered to my satisfaction.

I agree to participate in the activities, realising that I may withdraw without prejudice at any time.

I agree that the research data may be published provided that I am not identifiable.

Participant:
Date:

Investigator:
Date:

Appendix 10: Extracts from Whole Child Policy

Whole Child Policy

- **Rationale:**
- Montessori educational philosophy acknowledges that all children are unique in that they have individual:
 - Learning needs and styles.
 - Strengths and weaknesses in the Multiple Intelligences.
- All children will be given the opportunity to show their strengths by the use of a broad, flexible assessment system. In addition they will have the opportunity to become an "expert" in their chosen topic and will be assessed rigorously on this.
- The school considers the needs of every child individually, as indicated on the Whole Child Policy flow chart.
- The school has a shared understanding of the philosophy underpinning the Whole Child Policy, which incorporates provision for special needs students. This shared understanding includes relating to children as individuals (i.e. not comparing children) and talking about strengths and weaknesses (i.e. not labelling children).
- Special needs students will be identified by established criteria.
- The school acknowledges a responsibility to nurture special needs children by providing appropriate programs in a responsive learning environment in order to meet these needs.
- Programs and strategies specifically for the provision of special needs students will be employed. On a practical level this will require that teachers access information on, for example, specific disabilities, learning difficulties and degrees of giftedness (such as, dyslexia, ADHD, profound giftedness) to assist them in the selection of appropriate programs and strategies.

Goals:

- To provide Chrysalis students with an educational environment that will facilitate the greatest possible development of their abilities.
- To provide programs designed to meet the emotional, social and educational needs of our children.

Process:

- The process for identifying the "whole child" needs of the students involves assessment, analysis of results, discussion/program planning at Collaborative Problem Solving meetings and subsequent evaluation. The individual needs of most children will be addressed by this process.
- The needs of some children will require additional actions to be included in the process. Figure 2 incorporates these additional steps.

Assessment:

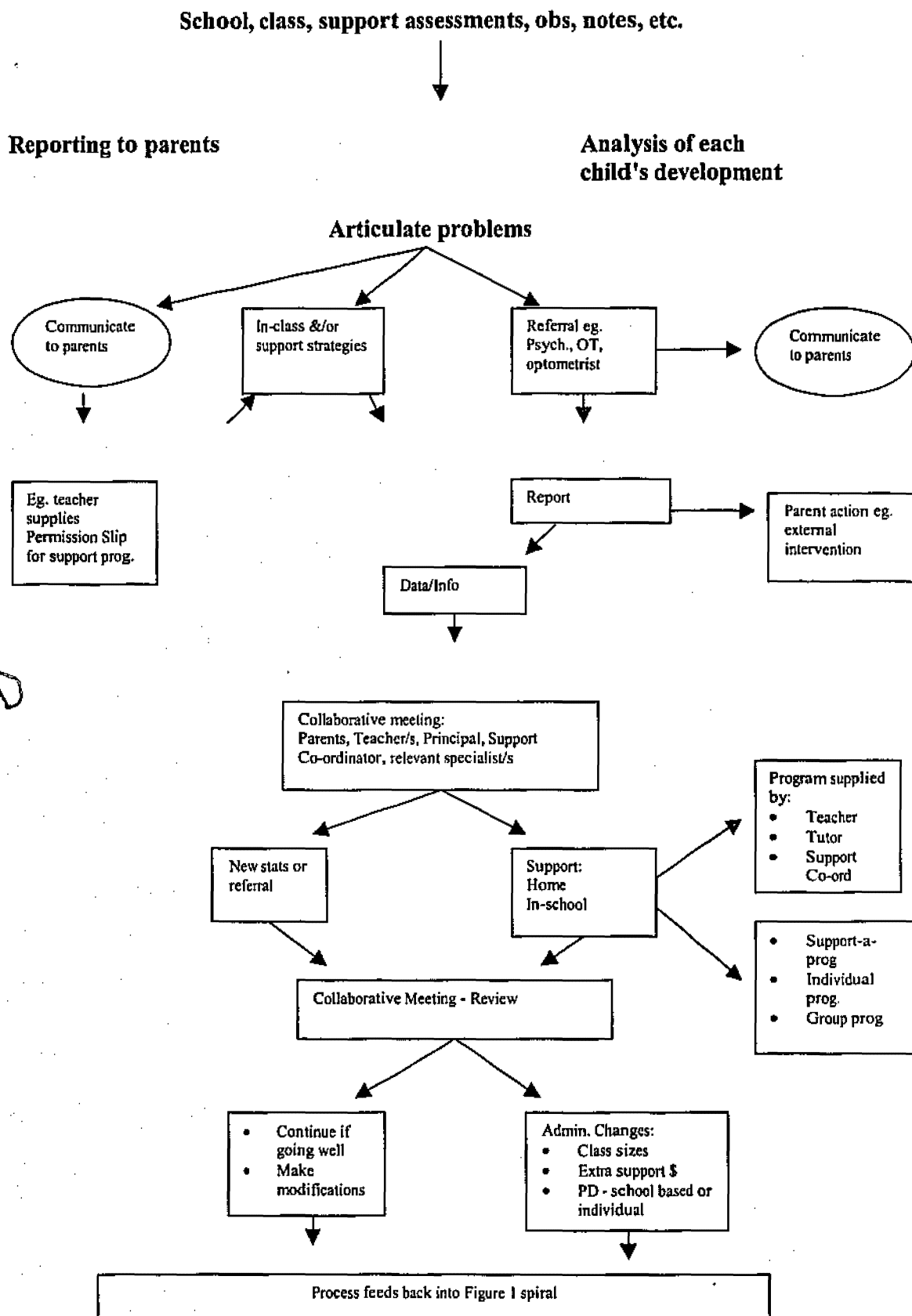
- A broad, flexible approach to assessment will be employed, incorporating formal and informal assessment methods, thereby providing opportunities for all children to show their strengths.
- Assessment of children for support to include methods that identify "hidden" sub-groups of special need e.g. underachieving children, gifted students with learning difficulties, gifted children with attention problems, gifted children with socio-emotional issues.
- For children requiring additional actions to be taken (Figure 2), indicators for intervention are shown on the Assessment Wheel.
- Priorities for extra support are determined by:

- The whole school perspective, recognising that all classes have children with significant strengths and weaknesses.
- A class needs basis in terms of the degree of special needs in a class. Thus all classes are not necessarily treated the same with regards to the amount of support provided, because any particular class may have more special needs requirements than another class.
- Funding, in terms of total number of support hours available in the school budget.

The Learning and Teaching Environment:

- Follows the goals and strategies outlined in the Strategic Plan.
- The learning/teaching environment specifically includes:
 - Whole school approach to deliver a differentiated curriculum that is continually responsive to the requirements of all children.
 - All teachers are responsive to the social/emotional needs of all students regarding common issues e.g. peer acceptance, intrinsic motivation, self esteem, goal setting, perfectionism, high sensitivity.
 - All teachers employ strategies for the provision of a differentiated curriculum e.g. independent study, open-ended tasks, acceleration as an option for the highly gifted.
 - Excursions and incursions are organised to provide enrichment opportunities.
 - Teachers work collaboratively to cater for the diverse range of student learning styles and needs.
 - Teachers provide programs for special needs students that focus attention on the children's strengths, rather than their weaknesses i.e. through the student's strengths the weaknesses are addressed e.g. use technological adaptations to bypass areas of weakness and allow areas of strength to show through, recognising that there is a place within this approach for targeted, explicit instruction in the areas of weakness.
 - Teachers are consistent in their approach to provide learning experiences that promote:
 - Problem Solving
 - Critical and Creative Thinking
 - Inquiry Learning
 - Utilization of Multiple Intelligences
 - Classroom environments are open and supportive of student differences.
 - Teachers work with the Developmental Extension and Support Co-ordinator (DESC) to enable the opportunity for student participation in e.g.: Maths Talent Quests, Science Talent Quests, Writing Competitions, Future Problem Solving, Virtual School for the Gifted, Tournament of the Minds, etc.
 - Establish links with the wider community to provide peer support for special needs students e.g.: other Montessori schools, community members/organisations, mentors.
- The school utilizes a range of identification criteria to identify students for special needs programs:
 - Character profiles in TAGS file, Learning Difficulties/ADHD files.
 - Educational assessment by psychologist / other specialists.
 - Standardised tests.
 - The broad range of identification criteria in the TAGS file e.g. parent/peer/teacher nomination, formal and informal assessments.
 - Multiple Intelligences profiles.
 - Based on research that reflects global appreciation of the varied nature of special needs students, esp. re. gender, culture, socio-economic background, underachievement, physical disability, socio-emotional issues.

□ **Figure 2: WHOLE CHILD POLICY INCORPORATING FRAMEWORK FOR SPECIAL NEEDS PROVISION**



Appendix 11: Attitude Scale Data

ATTITUDE SCALE DATA ANALYSED USING SPSS

Table A11-1

Frequencies of Pre-test Teacher Responses to Scale Items (n = 12)

Factor	Scale item no.	Totally disagree	Partially disagree	Un- decided	Partially agree	Totally agree
A: Needs and support	1	1		1	4	6
	9		2		5	5
	11		7	2	3	
	14		2		6	4
	15		1	2	3	6
	24	1	2	1	5	3
	30				5	7
	32	1	3	2	6	
B: Level of opposition	3	1	3	2	3	3
	4		4	2	2	4
	5	1	1	1	2	7
	12	1	2	2	2	5
	16		2	1	8	1
	18		6		4	2
	23		2	4	2	4
	26	1	2		3	6
	27	1	3	3	2	3
	28	1	2	2	4	3
C: Social value	13			1	3	8
	17	2	2	3	2	3
	25	1		4	3	4
	33		5	1	6	
D: Rejection	19	1	6	1	4	
	22	3	1	3	5	
	31		6	2	4	
E: Ability grouping	2	5	1	4	2	
	6	1	5	4	2	
	20	1	6	2	2	1
	21	2	7	1	2	
F: Acceleration	7	1	3	4	2	2
	8		3	3	3	3
	10		5	5	2	
	29		2	2	3	5
	34	1	2	4	5	

Table A11-2

Frequencies of Post-test Teacher Responses to Scale Items (n = 12)

Factor	Scale item no.	Totally disagree	Partially disagree	Un-decided	Partially agree	Totally agree
A: Needs and support	1				4	8
	9	2	1		5	4
	11	2	4	3	2	1
	14	1	1		6	4
	15			1	5	6
	24		2		4	6
	30				2	10
B: Level of opposition	32	1	4	1	4	2
	3	2	3	1	5	1
	4	1	4	2	2	3
	5	1	1	2	1	7
	12		2	2	4	4
	16		4	3	4	1
	18		6		6	
	23			3	2	7
	26	1		1	6	4
	27	1	2	2	3	4
C: Social value	28		1	1	6	4
	13			2	2	8
	17	2	1	3	4	2
	25	1		5	3	3
D: Rejection	33	1	6	4	1	
	19		7	3	2	
	22	3	1	5	3	
E: Ability grouping	31		5	5	2	
	2	3	7	1	1	
	6	2	4	3	2	1
	20	2	7		1	2
F: Acceleration	21	6	4		2	
	7	1	5	3	2	1
	8	1	4	3	3	1
	10	1	3	6	2	
	29		4	3	3	2
	34	1	2	5	4	

Appendix 12: Student Work Samples

In-class Work Samples of Gifted Year 4 Student with Writing Difficulties

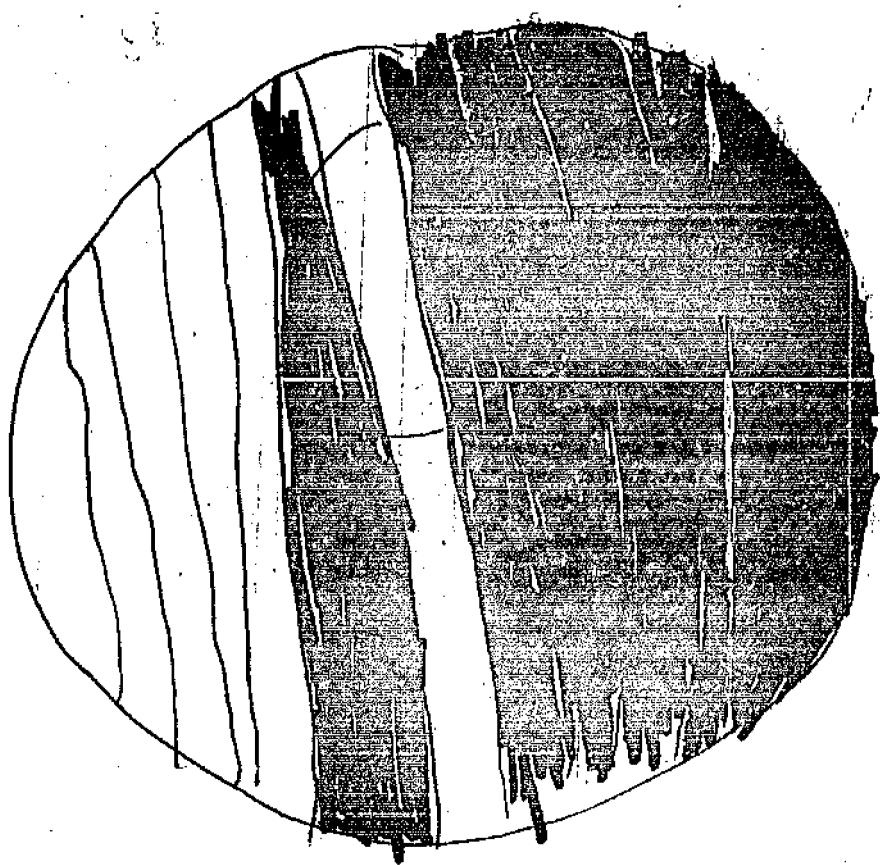
'Recount' Written at the Beginning of the Year

The Leaves on the tree
are green. I am in class.
[child's name] is coming
on Saturday to my house for a play
or sleep over.

'Recount' Written at the End of the Year

My Memory
I was two my dad was
reading paper. We were
at the duck pond. I
bent over to get a letter
X Look and... SPLASH
H I fell in but my
dad saved me.

'Report' Written at the Beginning of the Year in an In-class Context



tiger tiger's skin

The tiger's skin has black stripes.
~~that~~ help it catch its prey using sharp
claws and sharp teeth to catch its prey.

Report Written at the End of the Year in a Withdrawn Context

I am going to writing
about wild cats. I like
wild cats because they
kill stuff and are fast.
The wild cats that I
will write about are
cheetah and jaguar and
lion. The cheetah can keep
up a sustained chase, out running
even a gazelle. With its tail
always exposed, the cheetah is always
in running mode and has long
legs and has a long, narrow
body is built for speed and
rapid turning. cheetahs run
at 80 km per hour and are
the fastest animal on ^{Earth} earth.

This report continues for another half page.

Appendix 13: Sample Pages from Reflective Journal

Sample Pages from Reflective Journal

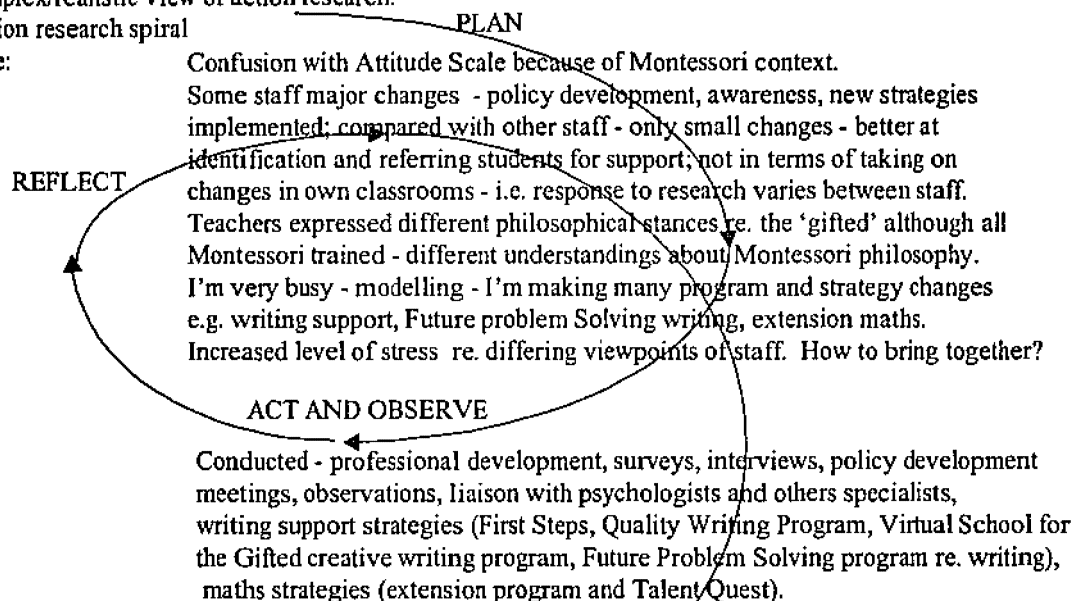
Hand written notes have been typed for ease of reading.

24/4/03 Reflections on the action research cycle:

No single action research spiral. Different stages of spiral for me, other individual teachers, and school as a whole. Link with Kemmis and McTaggart (2000) reference re. complex/realistic view of action research.

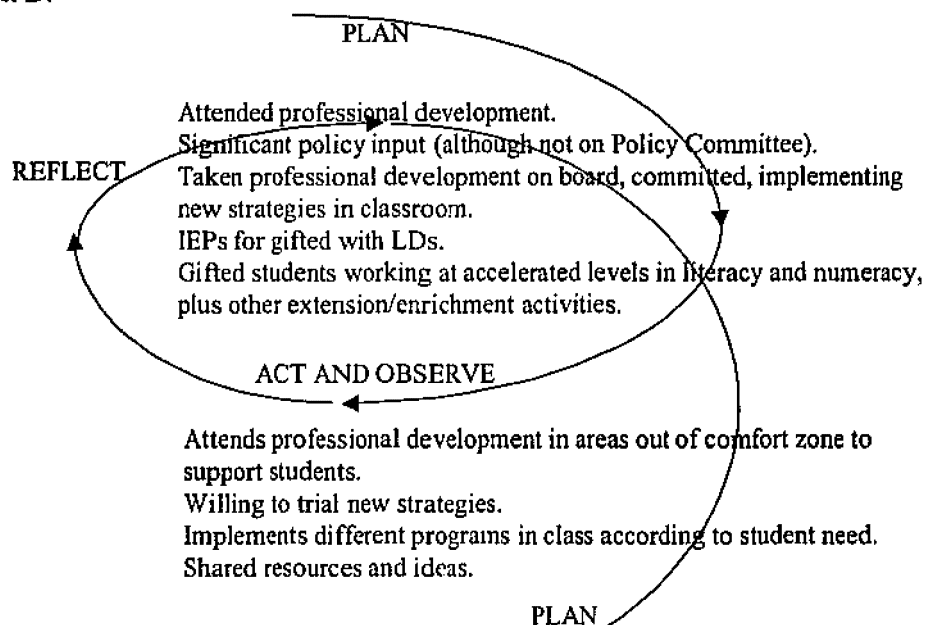
Action research spiral

- me:



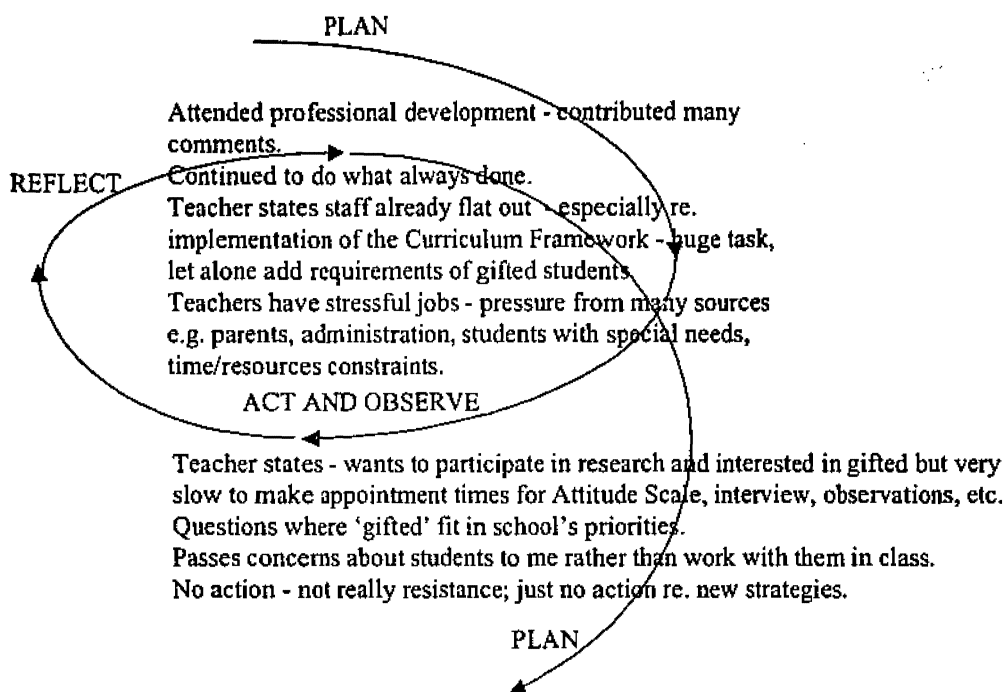
Action research spiral

- teacher D:

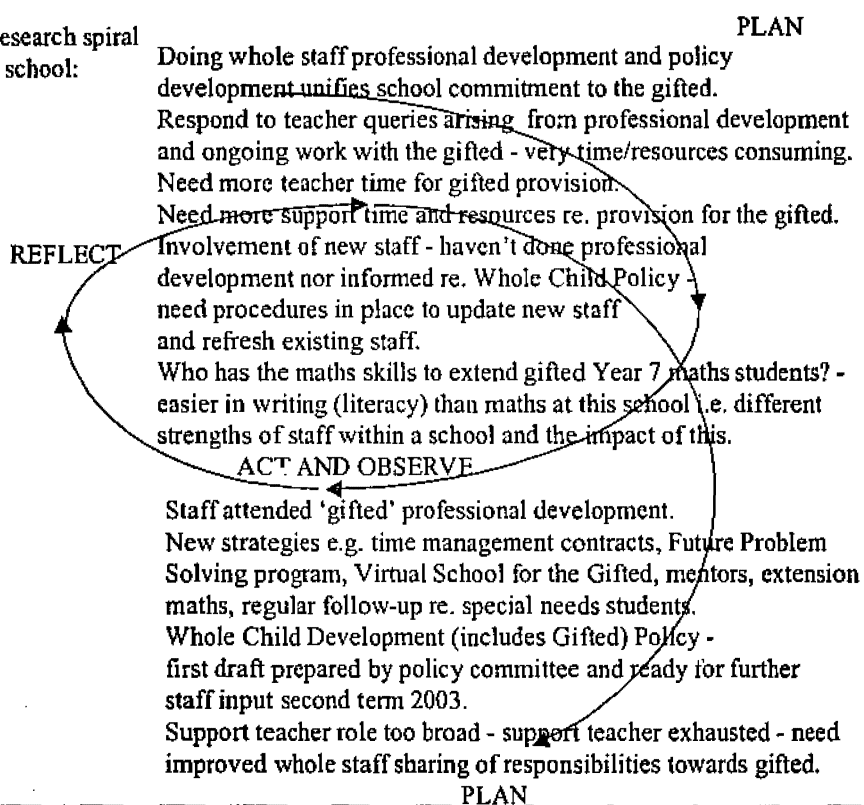


Even within Tripp's (2001) co-operation category of 'participation' there are levels of co-operation - as seen in teacher D's spiral compared with teacher E's spiral.

Action research spiral
- teacher E:



Action research spiral
- whole school:



Appendix 14: Student Outcomes

Assessments

WALNA Benchmark Testing:

The Western Australian Literacy and Numeracy Assessments are referred to as the WALNA benchmark tests (Association of Independent Schools of Western Australia, 2003d). The Western Australian Year 3, 5 and 7 Literacy (reading, writing and spelling) and Numeracy (space, chance and data, measurement and number) assessment program provides a standardised assessment of student achievement. It complements classroom assessments and is used by teachers to identify students' strengths and weaknesses, and to inform their teaching programs. The assessments also provide parents with information about their children's progress in relation to nationally agreed benchmarks. The benchmarks represent the minimum standard of literacy and numeracy skills expected for 8, 10 and 12 year old children, that is, the majority of students in school Years 3, 5 and 7 respectively.

EasyMark SOW:

This assessment refers to the Student Outcome Writing test (EasyMark, 1997). Relevant 'Levels' ('global' category) in writing, adapted from the EasyMark SOW assessment:

Level 1 (L1)

"Students who have achieved level one show a growing awareness of the many purposes for written texts. Students show an emerging awareness of the nature, purposes and conventions of written language. They experiment with using written symbols for conveying ideas and messages."

Level 2 (L2)

"Students who have achieved level two produce brief written texts understood by others that include related ideas and information about familiar topics. Students have a beginning knowledge of conventions for using written texts."

Level 3 (L3)

"Students who have achieved level three write longer texts, using ideas and information about familiar topics. They communicate familiar ideas and

information for particular purposes and known audiences. Students use many of the linguistic structures and features of a small range of text types. They make attempts at spelling new words."

Level 4 (L4)

"Students who have achieved level four use familiar ideas and information in their writing, showing control over the way some basic types of texts are written. They try to adjust their writing to meet readers' needs. They have a sound basic knowledge of how to use English." (EasyMark, 1997).

Relevant 'Scale' categories, adapted from the EasyMark SOW assessment:

Punctuation

Category 1 = Not in use; limited/inaccurate use of capital letters and full stops.

Category 2 = Some accurate use of capital letters and full stops.

Category 3 = Generally uses capital letters and full stops accurately.

Spelling

Category 1 = Uses initial letter and some known spelling patterns.

Category 2 = Spells some common words accurately.

Category 3 = Spells many common words correctly.

Vocabulary

Category 1 = Chooses a narrow range of simple or common words.

Category 2 = Chooses a range of simple or common words.

Category 3 = Most words are appropriate and convey general meaning.

Sentence control

Category 1 = Uses predominantly simple sentences and simple conjunctions.

Category 2 = Controls basic sentence structure.

Category 3 = Consistently demarcates sentences with appropriate punctuation.

Forms of writing

Category 1 = Beginning sense of the genre is evident.

Category 2 = Writes in the genre using appropriate framework.

Category 3 = Uses the appropriate genre framework with aspects linked.

Subject matter

Category 1 = Contains implausible ideas on conventional subject matter.

Category 2 = Contains plausible ideas on conventional subject matter.

Category 3 = Plausible ideas and moves beyond the predictable.

Text organisation

Category 1 = Attempts sequencing, although inconsistencies are apparent.

Category 2 = Text contains two or more connected ideas; little elaboration.

Category 3 = Uses times order to organise ideas; inappropriate elaboration.

Purpose and audience

Category 1 = Little information or development; reader shapes background.

Category 2 = Includes some information that orients reader.

Category 3 = Provides sufficient information to orient reader.

Torch:

The Torch test is a Reading Comprehension assessment

(Mossenson et al., 1995).

PAT:

The PAT assessment refers to the Progressive Achievement Test in Reading

Comprehension (Australian Council for Educational Research, 1986).

Neale Analysis of Reading Ability:

The Neale reading test examines Reading Accuracy, Comprehension and Rate (Neale, 1999). Table A14-1 only presented the reading comprehension result, for comparative purposes with the other assessments given.

S. Austn Spell:

This assessment refers to the South Australian Spelling Test (Westwood, 1999).

Appendix 15: Reconceptualisation of the Model

Reconceptualisation of the model: What actually happened to the Action Research Spiral

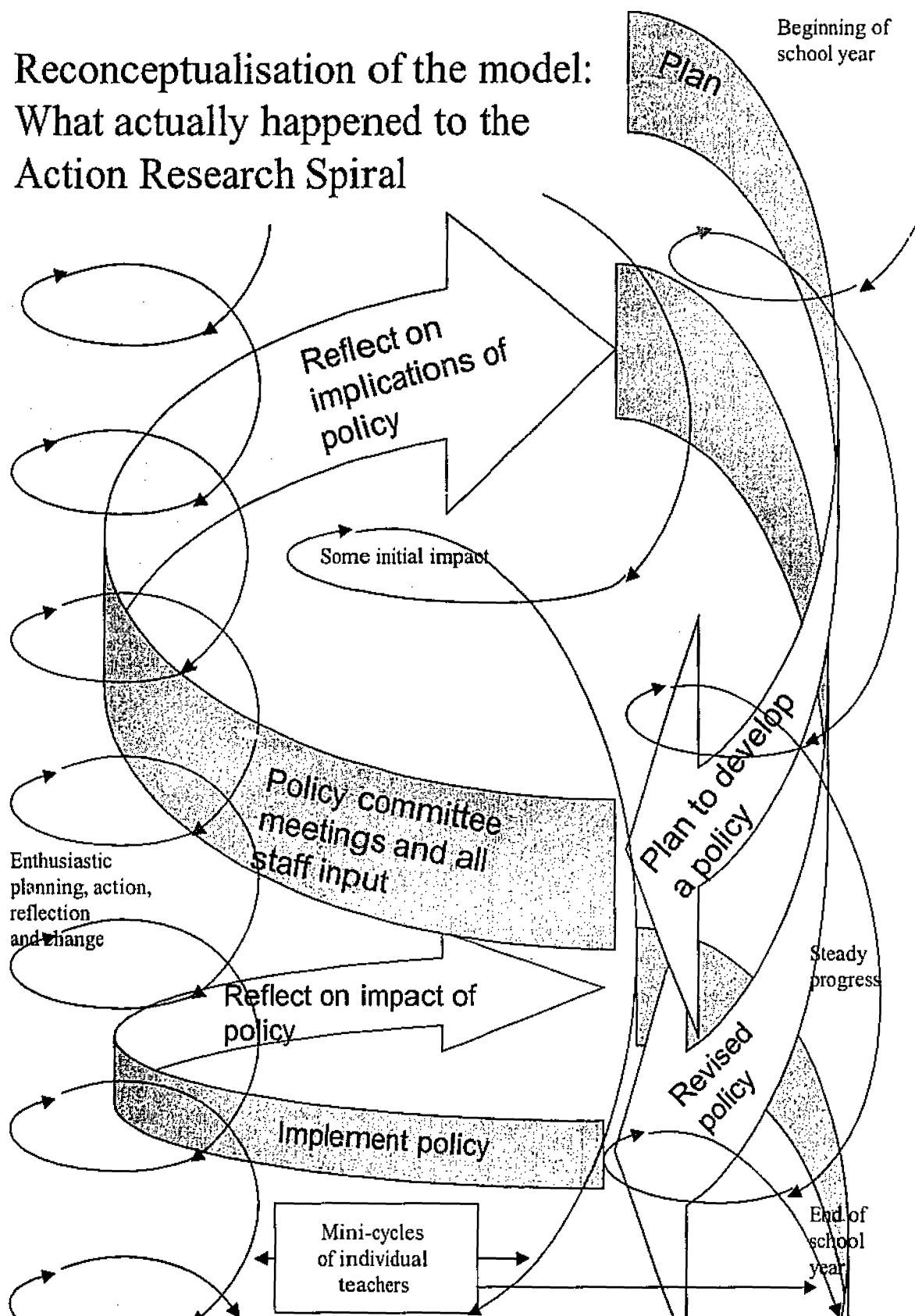


Figure A15-1. Modifications to the model of the Action Research Spiral