CHAPTER I

INTRODUCTION

There are sound reasons for wanting to improve the educational standards of our society and, in particular, for cultivating the talents of the most able youth, so one would hope that there is a growing respect for intellectual ability in such a climate. On the contrary, however, this respect for intellectual achievement has not been particularly obvious, and one must ask what value is placed on mental superiority. Gross (1993) argued that Australian society has a national intolerance of intellectuals and that as a consequence the development of suitable programs for the gifted is unlikely. Possibly the most important issue facing those people concerned with gifted education in Australia is that of the national attitude toward highly able children (Wilson, 1996).

Australian society is one that has few, if any, intellectual achievers who could be considered household names. They do exist, indeed there are many, such as the Australian scientist who received the Nobel prize for science in 1996, but how many would be able to name him if asked? On the other hand if one asked who were our sporting achievers, it would seem safe to assume that a number of individuals could be named. If the wider society does not value academic achievement then surely universities must. Australia has a large number of universities, relative to its small population. This would seem to indicate a high level of support for the pursuit of intellectual growth and development, at least in financial terms. Universities are institutions that should foster a love of learning and encourage the pursuit of academic excellence.

Another institution that should cultivate an environment that respects the pursuit of academic excellence and achievement is the school. Teachers are charged with the responsibility of educating our children and preparing them to meet the challenges of the society in which they will live. Logically, teachers play a pivotal role in developing and supporting an environment in schools that is equitable, respects issues of social justice and allows all students to realise their individual potential. If this is the case why then would it seem that Australia has fostered a 'cult of mediocrity', particularly within schools (Gross, 1993)?

Academic excellence has not received the attention it deserves and consequently many gifted children are not realising their true potential. There seem to be two agendas operating in Australian schools: one is the pursuit of excellence; the other is the social justice issue of equality. It would seem that in the past these agendas were not able to be achieved at the same time (The Senate Select Committee, 1988). The implication of this conflict was that the achievement of both excellence and equality was difficult, because of finite resources.

Education of the gifted was not seen as a priority and there were perceived to be other far more needy children requiring special attention. The essence of the problem is that the terms equality and equity have been confused. The term 'equality in education' would imply equal treatment and equal outcomes regardless of ability or disability. Such a situation is both undesirable and impractical. Equity implies treating students as individuals and an acceptance of differential outcomes. Differing levels of achievement are a logical outcome of individuals realising their highest potential. For equity to occur teachers need to accept the fact that the gifted child is a child with special needs.

Historical perspective

The history of Australian education has had two dominant themes, the changing balance of power between the state and the church and that of centralised administration. Over 25 percent of children in New South Wales today attend non-government schools. The Report of the Committee of Review of New South Wales Schools (1989) noted that this is remarkably high when compared with countries such as New Zealand, the United Kingdom, the United States and Japan. As a result of The Public Schools Act (1866) there was a steady increase in the campaign for free, compulsory and secular schooling in New South Wales. Despite this, in 1914 only about 75 percent of children of school age attended school regularly. Prior to the 1940s the great majority of pupils left school before the age of 14. As the report explained, schooling was not yet a significant factor in determining life chances and most were not interested in a prolonged education (Committee of Review of New South Wales Schools, 1989). In a society where education was not particularly important for economic and social advancement, advanced schooling was frequently neglected and seemingly not valued.

In the 1950s Australia was emerging from the post-war years and entering a period of full employment, economic prosperity and rapid population growth. At the same time the benefits of education for improving life chances were becoming more apparent, and education was firmly linked with the social and economic advancement of the individual (Committee of Review of New South Wales Schools, 1989). Over the next few decades a plethora of reports emerged and helped shape the future of education in New South Wales. During this time signs were beginning to emerge that education must be for all, in the broadest sense.

There was strong emphasis on increasing equality of educational opportunity. It was during the 1970s that the issue of education for gifted children began to be included on the educational agenda. Commonwealth involvement in the education of gifted and talented children did not begin until the Commonwealth Schools Commission Act in 1973. While the reference given to gifted education in the act was rather general in nature it did provide official recognition of the importance of this educational area (Wilson, 1996).

Educational provision for gifted children was not a popular cause in the 1970s. Australia was a nation that decried special attention to academic precocity and equated giftedness with privilege (Braggett, 1985). Braggett (1985) concluded that by 1975 the Federal Labor Government was concerned with correcting social injustices and gifted children were not seen as disadvantaged. By the end of that decade the situation in schools did not appear to have been much better, Goldberg (1981) noting that there was only modest interest from teachers in the educational provision for the gifted.

Despite this initial reluctance to provide educational programs for gifted children, by 1988 a Senate select committee had reported on the education of gifted and talented children. Support for gifted education continued and changing economic and social conditions, as well as ideological changes, saw both the New South Wales State Government (see Appendix A) and the New South Wales Department of School Education (see Appendix B) make public policy statements on the education of gifted and talented children in April and November 1991, respectively.

The Tannenbaum study

In 1962 Tannenbaum published a monograph in which he questioned whether intellectual talent was widely valued and fostered in American society. He speculated that the message being relayed to bright youth was that intelligence was something to be hidden. This concern led Tannenbaum to complete a landmark investigation of children's attitudes regarding academic achievement, effort and athleticism. He questioned whether the group having a major influence on adolescent attitudes, their peers, held positive views of their intelligent classmates. He theorised that students' low regard for intellectual pursuits affects their own aspirations in that area as well as those of their school mates.

Tannenbaum (1962) asked adolescents (16-year-olds) to rate the acceptability of a set of hypothetical characters on a variety of positive, negative or neutral character traits. Hypothetical characters differed with regard to three dichotomous traits: academic ability (brilliant/average), academic effort (studious/nonstudious) and athleticism (athletic/nonathletic). Each character was described in a three-sentence paragraph, one trait per sentence, resulting in eight different hypothetical characters. Tannenbaum used students' responses to compute a mean global score of acceptability for each type of character.

Tannenbaum first asked a group of students to rate 54 traits as desirable or not. He then was able to decide which traits were seen as desirable or undesirable. If there was not a clear indication (greater than 70% agreement) as to the desirability or not of a trait it was not included in any further analysis. He then asked another group of students to read a description of a hypothetical student and decide if the same list of traits was descriptive or not of that student. Based on the yes/no responses and using the information obtained about whether a trait was desirable or undesirable, Tannenbaum computed a global score of desirability for each hypothetical character.

The global scores were numerical ratings for each stimulus character that indicated the attitudes held towards them. Questionnaires were scored by assigning one point for every 'yes' indicated for a desirable description and one point for every 'no' indicated for an undesirable description. One point was subtracted from the score for every 'yes' indicated for an undesirable description and also one point was subtracted for an answer of 'no' for a desirable one. Responses to the neutral descriptions and omissions were not scored. Thus, a global attitude score was assigned to each hypothetical student, with the highest positive score representing the most positive overall attitude.

The study found that academic brilliance, in and of itself, neither promoted nor hindered a character's global acceptance. However, athletic characters were clearly viewed as more acceptable than nonathletic characters and nonstudious were seen as more acceptable than studious characters. It would seem these results indicated that school children were operating in an environment where academic effort was negatively regarded by peers (Tannenbaum, 1962).

Carrington (1993) set out to examine whether the findings of Tannenbaum (1962) would be replicated in an Australian context and with adolescent school children in a different time frame, the late 1980s. The findings of the Australian study were similar to the North American study but with one important difference. In the Australian study the average character was significantly preferred to the brilliant character. The results provide some valuable insights into adolescent perceptions of ability, effort and athleticism. The teenagers surveyed appeared to find those who were average, nonstudious and athletic desirable, and those who were brilliant, studious and non-athletic generally much less desirable.

The adolescent world placed considerable value on sports-mindedness. It would also seem that it was relatively acceptable to study hard to get average grades, but not so if you studied to achieve high goals (Carrington, 1993). Thus it might be concluded that adolescents in the Australian school setting were operating in an environment where not only was academic effort negatively regarded by peers, but also the pursuit of academic excellence.

As Udvari and Rubin (1996) concluded, the findings of the Tannenbaum study have considerable implications with respect to academic underachievement. Children demonstrating high academic achievement may be putting themselves at risk of social rejection, and especially so if they were not athletically inclined (Tannenbaum, 1962). These implications are also present in the Australian context. The added concern is that students may be forced to hide or deny their academic ability and also be reluctant to apply themselves to their studies and thus not achieve their true potential.

Significance of the problem and purpose of this study

One of the major concerns of parents today is that their children will receive an education commensurate with their ability. There seems to be little argument that this indeed is desirable, and it would seem safe to assume that educators and parents would agree that students should study hard and endeavour to achieve as well as they are able. Yet, one may ask; how do preservice teachers, those charged with the future responsibility of educating our children, view their potential students?

The attitudes that teachers hold about their students may influence the educational outcomes for those students. It has been stated that the attitudes preservice teachers hold about giftedness are learned relatively early and are insensitive to experience, or that experience is consistent with these preconceptions (Guskin, Peng & Majd-Jabbari, 1988). If this is the case, then there is a very real need for empirically based research into what attitudes preservice teachers hold towards their gifted students. Such findings would provide information necessary for policy makers to make informed decisions. Further to this, it is important to ascertain whether there are differences between the attitudes of primary and secondary preservice teachers.

As part of the process of improving the preparation of teachers, there is considerable pressure today to increase the length of the initial training of teachers from three years to four years. There are many competing viewpoints as to how these preservice courses should be structured. Stakeholders, such as employing authorities, teacher organisations, parent and community groups as well as teacher educators, all have strong opinions. The role of a teacher has changed dramatically in the past few decades and is becoming more complex and more difficult.

The general student population has an increased ethnic and language diversity, retention rates have risen and students with disabilities are now integrated more often into mainstream classrooms (The Schools Council 1990). Further to this, the report of The Schools Council (1990) explained that one of the characteristics that distinguishes Australian education internationally is the control that teachers are able to exert over their own teaching programs. This, coupled with the dramatic expansion of professional tasks, has placed considerable demands on classroom teachers.

Such a range of social issues is a considerable responsibility for teachers to confront and one would hope that students undertaking a preservice course of education would be doing so with a strong sense of desire to teach. This is not always the case, as Carpenter and Foster (1979) found that many preservice teachers entered their teaching courses by default with no clear commitment, while less than half entered because they were interested in becoming a teacher. The situation may have improved, for Brookhart and Freeman (1992) concluded that the primary reasons students enter into teacher education courses were altruism, service orientation and intrinsic motivation (such as a desire to work with children and an interest in the subject matter). There is also evidence that the motivations for going into teaching may vary for primary and secondary preservice teachers, with primary preservice teachers more likely to suggest child-centred reasons and secondary teachers that they like teaching the subject matter (Brookhart & Freeman, 1992).

For many years now the terms brilliant, gifted and talented have carried dubious connotations for those labelled as such. There is no doubt that more able persons have the potential to achieve much success professionally. However, it is likely that this potential remains unrealised for fear of affecting personal popularity. As Wilson (1996) explained, general attitudes affect socio-political responses to gifted education and therefore the resources made available to the education of gifted children.

Hall (1993) believed that many teachers, whether it be through embarrassment, fear or lack of understanding, fail to allow gifted children the intellectual, emotional and social autonomy they crave. Ideally teachers and preservice teachers should not only accept, but also nurture the gifts of their students and be cognisant of any biased attitudes they harbour.

There are clearly a number of considerations combining to highlight the need for an examination of preservice teachers' attitudes towards the students they teach. One such consideration is the current concern with equity in education and the confusion between equality of access to educational opportunity and equality of outcomes. Gross (1993) argued that the push for equality of educational outcomes has occupied the attention of a large number of politicians, educational bureaucrats and teacher union leaders for much of the 1980s and early 1990s. Such a climate has led to a situation where intellectual superiority is not a source of national pride and to a dominant mythology that all people should be equal. It would seem that academic success for students is acceptable only when it has been achieved without an extraordinary amount of effort or without the provision of additional resources.

For the reasons outlined above, there is an urgent need to determine whether mental superiority enhances or diminishes the social status of its possessor in the eyes of our future educators. If preservice teachers value and respect education, then ideally they must allow each child to maximise his or her potential regardless of ability or gender.

Overview of the study

This study compared preservice teacher attitudes towards two types of students, one gifted and the other average. It sought to ascertain whether any differences in reaction to such types of students were affected by those contrasting ability characteristics independently or through interaction with other personal attributes such as studiousness and gender. Also investigated were the gender of the respondents, the university they attended, their year of study and their intended level of teaching- secondary or primary. Preservice teachers were asked to respond to one of eight hypothetical students.

The students described in the social perception questionnaire represented all eight possible combinations of gifted/average, studious/nonstudious and male/female: gifted-studious male; gifted-studious female; gifted-nonstudious male; gifted-nonstudious female; average-studious male; average-studious female; average-nonstudious male and average-nonstudious female. There were eight questionnaires used for primary preservice teachers (see Appendix C) and eight questionnaires used for secondary preservice teachers (see Appendix D). In order to compare their responses a global score was developed.

As Tannenbaum (1962) noted, a major problem with the computation of his global attitude score was the assumption that all traits identified as desirable were equally desirable and all traits identified as undesirable were equally undesirable. The present study used a Likert scale questionnaire with a group of primary preservice teachers (see Appendix E) and another Likert scale questionnaire (see Appendix F) with a group of secondary preservice teachers. The questionnaires were used to rate the desirability of the 54 traits on a Likert scale or declare them as "not relevant". Using a Rasch Modelling technique, weights were assigned to each of the traits in terms of their level of desirability and those traits clearly identified as "not relevant" were not included in any further statistical analysis.

At the same time as the groups of primary and secondary preservice teachers were completing the Likert scale other groups of primary and secondary preservice teachers were asked to read a description of a hypothetical student and decide if the same list of traits was descriptive or not of that student. Based on the yes/no responses and using the information obtained from the Likert scale data about trait desirability weightings, it was possible to compute a global score of desirability for each hypothetical student. The scoring procedure used was very complex and is outlined in detail in Chapter Three.

Another significant issue in regard to studies of this type is how people respond to inferred characteristics. When we meet someone for the first time and then later interact with them we gain a variety of information and impressions. However, when one is presented with an imaginary character described in a few lines it is open to question whether the reactions are largely governed by the information presented. Such an assumption neglects the possibility that the reactions are not only to the stated attributes of the imaginary stimulus character but also in response to other unstated or implied characteristics. For example, when a preservice teacher is asked if a gifted-studious female is a "walking dictionary" the answer may be yes because the respondent feels that this type of student reads a lot of books and has a large vocabulary. Thus, as Tannenbaum (1962) pointed out, the reaction was to an inferred characteristic rather than exclusively the stated one.

For this study, in order to make a more detailed and meaningful interpretation of attitudes, each of the stimulus characters was presented in terms of ability, studiousness and gender. Tannenbaum (1962) and Carrington (1993) used athleticism instead of gender when examining adolescent attitudes and the preference for athletes as opposed to nonathletes was clear. The attributes of ability, studiousness and gender all have significance when considering the way preservice teachers view school students.

One would expect and hope that preservice teachers would value studiousness in the students they teach and respect students regardless of their ability, if they applied themselves diligently. In the current climate of equity in education, it would also seem reasonable to assume that the gender of students should not have an effect on the attitudes formed by preservice teachers, and also that the gender of the preservice teacher should not be an issue related to differences in attitude.

In the studies of Tannenbaum (1962) and Carrington (1993) studiousness was clearly seen as undesirable by adolescents while athleticism was revered. The ideal adolescent according to the findings of Carrington (1993) was the average-nonstudious athlete while the gifted-studious nonathlete was clearly not preferred. Do our preservice teachers take a more positive view of academic application? How do they perceive students who achieve well at school and is their opinion altered if that student has studied hard to achieve those high results? In light of the known interest of Australian society in sports it seemed redundant to add athletic-mindedness (or absence of it) to the description of each stimulus character.

Research questions

Given the issues raised in this chapter the present study was designed to address the following six research questions:

(a) What attitudes do primary and secondary preservice teachers express towards academically gifted students compared to average students?

(b) What attitudes do primary and secondary preservice teachers express towards female and male students?

(c) What attitudes do primary and secondary preservice teachers express towards students who study hard as opposed to those who do not?

(d) Are there differences between male and female primary and secondary preservice teachers in their attitudes towards students in terms of gender, academic ability and application to studies?

(e) Are there differences between the universities the primary and secondary preservice teachers were attending when considering their attitudes towards students in terms of gender, academic ability and application to studies?

(f) Are there differences between the year of study the primary and secondary preservice teachers were enrolled in when considering their attitudes towards students in terms of gender, academic ability and application to studies?

Defining terms

The purpose of this study is not to define or to identify gifted students nor does it ask survey respondents to do so. Rather, the study examines preservice teachers' attitudes towards gifted students by asking them to respond to the various stimulus characters with which they were individually presented with using the traits listed. It is acknowledged that the description of giftedness offered in the survey is not all inclusive, but it is not designed to be. Its purpose is to act as a prompt to draw an emotional response from a preservice teacher when confronted with a particular stimulus character.

The term preservice teacher is used to describe the 1470 respondents to the survey used in this study. They were all tertiary students undertaking a course of study preparing them to become classroom teachers. Some preservice teachers were involved in a three-year or four-year sequence of undergraduate study while others were undertaking a one year postgraduate course after completing an initial non-teaching degree. The term primary preservice teacher is applied to all those who indicated they were preparing to teach in primary schools, typically with children aged approximately 5-12 years. The term secondary preservice teacher is applied to all those who indicated they were preparing to teach in secondary schools, typically with children aged approximately 12-18 years.

Anderson (1981) defined an attitude as a moderately intense emotion that prepares or predisposes an individual to respond consistently in a favourable or unfavourable manner when confronted with a particular object. This study describes the attitudes primary and secondary preservice teachers held towards the various hypothetical characters. It does not imply that such an attitude is indicative of the behaviour that primary and secondary preservice teachers might adopt with those students.

Gifted students as defined by the New South Wales Government Policy (1991) are those with the potential to exhibit superior performance across a range of areas of endeavour while talented students are those with the potential to exhibit superior performance in one area of endeavour. This distinction between gifted and talented is sometimes used but is not universally accepted. The term gifted may be used to describe very high ability while talented describes those of high ability. Still other groups will use the terms interchangeably. Gagné (1995) offered another interpretation by defining giftedness as potential significantly beyond the average and talent as performance, or realisation of that potential.

This study used a simple description of a gifted student. A gifted student was described in this survey as one who is always among the highest in class in all academic subjects. It was also necessary to offer a description of an average student in order to contrast the ability of the hypothetical students. An average student was one who received fair grades in all academic subjects. The gifted or average student could also be male or female, the only cue given in the stimulus character's description being the words *he* or *she* in italics.

A student described as studious was one who spent more time at home studying school subjects and doing homework than did most students. The nonstudious student was one who spent no more time at home studying school subjects and doing homework than did most students. It is acknowledged that the term nonstudious does imply someone who did little or no study and that perhaps a term such as average-studious could have been used but this term may have been confused with the student described as average in terms of ability. As the term nonstudious has been used in this way in a number of studies, Tannenbaum (1962), Cramond and Martin (1987), Glover (1993) and Carrington (1993), it was adopted in this study.

Assumptions and limitations

It was assumed that the use of Tannenbaum's trait list, constructed in 1962 for use with an adolescent population, was suitable for administration to a preservice teacher population, with appropriate modifications. Cramond and Martin (1987) conducted a replication of Tannenbaum's work using the same instruments with preservice teachers and the findings confirmed their validity. In order to evaluate this assumption the trait list was first tested on a representative sample of preservice teachers and the modifications made are outlined in Chapter Three.

Conclusions of the study are limited by the size and selection of the sample. In order to confirm the attitudes preservice teachers hold towards the students they will teach a larger sample would be desirable. The present study was conducted on a large sample of preservice teachers from one Australian state, New South Wales. Even though all data were collected during the same period of government, it must be noted that the New South Wales Department of School Education has recently given significant attention to policy formulation and implementation regarding gifted students. For all of these reasons any attempt to generalise the results of this study to preservice teachers in other states or overseas needs to be done so with caution.

As Tannenbaum (1962) pointed out, the various limitations of the global score as indicating the degree of character acceptability suggest that it be interpreted in a relative rather than an absolute sense. The global score is appropriate for making comparisons among the stimulus characters through a single rating that is based on a wide variety of criteria. As one of the major aims of this study was to investigate the acceptability of the characters relative to each other, a general comprehensive measure was the most efficient means of realising this aim. The global scores developed and methodology employed were significantly refined from those of Tannenbaum's (1962) study.

Summary

This chapter has provided an introduction to the study undertaken by outlining briefly the historical perspective of education of the gifted in Australia as well as raising concerns about how Australian society values and supports the development of gifted students within its schooling system. The significance and the purpose of the study have been outlined, terms have been defined and the limitations of the study noted. As preservice teachers play an important role in the future of educating gifted students a number of research questions have been developed to ascertain what attitudes they hold towards the gifted, if equity is to be achieved for all students.

In the second chapter a critical review of significant research findings concerning the attitudes held towards gifted students by their peers, preservice and inservice teachers and the wider community is made. Factors affecting the formulation of attitudes such as ability, effort and gender are examined and the efficacy of measuring attitudes is also addressed. In order to establish how these findings have impacted on policy formulation regarding the education of the gifted, the Australian situation and more specifically, the New South Wales situation are reviewed. Finally a number of conclusions are offered as guidelines for the design used in this study.

The third chapter provides detailed descriptions of the methodology of the study, outlining the instruments used, the sampling plan, administrative procedures followed and the response rates obtained. An explanation is made of the analytical techniques applied, together with discussion of threats to validity and reliability. In particular a detailed explanation is given of the Rasch Rating Model and how it was utilised in the scoring procedures is demonstrated.

In chapter four the two sets of results to emerge from this study are detailed. The first set of findings was obtained from an analysis of the polychotomous data from the Likert scale questionnaire. It was concerned with the relevance and desirability weightings of the original list of 54 traits presented to primary and secondary preservice teachers. The second set of findings was obtained from an analysis of the dichotomous data from the surveys presented to primary and secondary preservice teachers. It is important to note that the first set of findings was used to determine traits that would not be included or analysed, as well as to provide weightings to those traits that would be used in the three-way and four-way ANOVAs. This chapter has been divided into two sections, the first dealing with trait desirability findings and the second dealing with answering the original research questions.

Finally, in chapter five the findings of this study are discussed. Firstly the findings concerning trait desirability for both primary and secondary preservice teachers and then key findings with regard to the ability gender and studiousness of students and gender, university attended and year of study of the preservice teacher are discussed. Based on the discussion of these findings, implications are discussed for gifted and talented policy in New South Wales, for the education of gifted students, with particular reference to gender, and for the teaching profession and preservice teacher education. To conclude, the key findings are summarised and possible future directions for research studies are offered.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The question of how society in general perceives people with superior academic ability has not received the attention it deserves. Indeed, researchers have not subjected the question to rigorous study at all. Bégin and Gagné (1994) conducted a comprehensive review of research in this field and concluded that there was a lack of consensus about attitudinal research on gifted children and a serious lack of quality. In Australia there appears to be a lack of consensus also, but this may be mainly due to the fact that so little research has been carried out in this area. Much of the research carried out in Australia, as in other countries, has been concerned with the identification of the gifted.

The following review offers a critical appraisal of significant research findings concerning the attitudes held towards gifted students by their peers, preservice and inservice teachers and the wider community. Factors affecting the formulation of attitudes such as ability, effort and gender are examined and the efficacy of measuring attitudes is also addressed. In order to establish how these findings have impacted on policy formulation regarding the education of the gifted, the Australian situation and more specifically, the New South Wales situation are reviewed. Finally a number of conclusions are offered as general themes emerging from the research studies reviewed.

Ability and effort issues

Fox (1968) argued that America had a long history of anti-intellectualism owing to its pioneering traditions where physical prowess, rather than intellect, was needed to conquer the wilderness and proposed that success is acceptable only when achieved by those of modest ability. Another popular belief has been that advanced intelligence breeds unhappiness and an increase in neurotic traits and illness, as well as an inability to adjust socially (Gurko, 1953). The traditional belief in equality for all may have greatly influenced anti-intellectual attitudes in society. Several writers contend that this traditional belief jeopardises the achievement potential of the more gifted (Tannenbaum, 1962; Fox, 1968).

Tannenbaum (1962) argued that the emphasis on conformity to group norms had led American society to foster a cult of mediocrity, and the same has been said of Australian society (Gross, 1993). Those with the most ability are asked to mark time while the less able are brought up to par (Fox, 1968; Cramond & Martin, 1987). This notion is generally not challenged, although Colangelo and Kelly (1983) found that the attitude of general students towards the gifted was neutral. They also suggested there was not enough evidence to support the theory that gifted students suffered peer rejection, but they did acknowledge that academically oriented programs were not valued by adolescents. The Colangelo and Kelly (1983) study, conducted in six rural schools in Iowa, does not produce generalizable information about teacher attitudes as the sample size was only twelve. Chapman and McAlpine (1988) found that although gifted students have higher academic and social self-concepts, they are generally not satisfied with their schooling experience.

Tannenbaum (1962) concluded that those who pursue higher intellectual endeavours do so at the risk of social rejection and that anti-intellectualism had permeated social and political life in America including the school system, crippling incentives towards achievement among high school students. In 1962 Tannenbaum published a monograph in which he questioned whether intellectual talent was widely valued and fostered in American society. On the contrary, he speculated that the message being relayed to bright youth was that giftedness was something to be hidden. He questioned whether the group having a major influence on adolescent attitudes, their peers, held positive views of their gifted classmates. He theorised that students' low regard for intellectual pursuits affects their own aspirations in that area as well as those of their school mates.

In researching the factors that influence adolescent acceptance of a peer, Tannenbaum became interested in two characteristics, other than intelligence, that he saw as important in determining acceptance. Studiousness and athleticism were included to determine the effects that such attributes had on adolescent views of individuals who possess them. Therefore, Tannenbaum investigated the effects on the attitudes of high school students when three characteristics were attributed to hypothetical peers: academic brilliance, studiousness, and athleticism.

The results of Tannenbaum's initial investigation (see Table 2.1) in a large urban high school in New York demonstrated tha the subjects showed no strong reactions to the hypothetical characters possessing the attribute of academic brilliance. Rather it was the combination of the other two characteristics, studiousness and athleticism, that stimulated strong reaction. A nonstudious, athletic minded character could be either brilliant or average with little difference in the rankings. However, if the stimulus characters were studious and nonathletic they were perceived more negatively if they were also brilliant, than were their average counterparts.

Table 2.1. Mean global scores: New York City (N=615) Tannenbaum (1962)

Brilliant Nonstudious Athlete	Average Nonstudious Athlete	Average Studious Athlete	Brilliant Studious Athlete	Brilliant Nonstudious Non-Athlete	Average Nonstudious Non-Athlete	Average Studious Non-Athlete	Brilliant Studious Non-Athlete
28.4	26.1	24.2	23.8	11.8	10.07	8.4	2.2

As the four athletic characters were ranked higher than the nonathletic, athleticism appeared to be the key determinant for social acceptance. In addition, nonstudious students were rated more positively than their studious counterparts. When repeated at other schools, public and private, in other locations in the United States the results were comparable. High school students everywhere disliked the brilliant, hard working, nonathletic student. Glover (1993) carried out a replication of Tannenbaum's 1962 study examining the attitudes of Canadian adolescents and the findings (see Table 2.2) were similar to those of Tannenbaum (1962).

Table 2.2. Mean global scores: Canada (N=180) Glover (1993)

Brilliant Studious Athlete	Brilliant Nonstudious Athlete	Average Nonstudious Athlete	Average Studious Athlete	Average Studious Non-Athlete	Brilliant Nonstudious Non-Athlete	Average Nonstudious Non-Athlete	Brilliant Studious Non-Athlete
28.99	27.29	23.92	20.24	11.17	8.58	6.36	4.1

Carrington (1993) carried out a systematic replication of Tannenbaum's (1962) study in Queensland (Australia) to examine the effect of different cultural settings and time frames. The results (see Table 2.3) offered valuable insights into Australian adolescent perceptions of ability, effort and athleticism. The teenagers surveyed appeared to find those who were average, nonstudious and athletic desirable, and those who were brilliant, studious and non-athletic much less desirable. However, it appears that the academically brilliant are not simply less desirable because of their intellectual ability. It appears the rejection results from an interaction with traits that are not acceptable to the adolescent world.

Table 2.3. Mean global scores: Queensland (N=548) Carrington (1993)

Average Nonstudious Athlete	Brilliant Studious Athlete	Brilliant Nonstudious Athlete	Average Studious Athlete	Average Studious Non-Athlete	Average Nonstudious Non-Athlete	Brilliant Nonstudious Non-Athlete	Brilliant Studious Non-Athlete
23.9	21.4	21.1	17.7	5.3	2.6	2.3	0.9

With regard to effort in schools, Carrington (1993) found adolescents vary in their opinion of who should be seen to study hard. Academically average athletes who do not study were far more preferable than those who do. Adolescents had a slight preference for the academically brilliant athlete who studies as opposed to the one who does not. For a nonathlete the situation was reversed. The average studious student was preferred to the nonstudious and the brilliant nonstudious was preferred to the brilliant studious. Again it appeared that effort alone does little to affect one's social acceptance, but when it interacts with other characteristics the outcome may vary considerably. It would appear that Australian students found it relatively acceptable for nonathletes to study hard to get average grades, but not so if the studying was to achieve high goals. Carrington (1993) concluded that Australian adolescents place enormous value on sports-mindedness. Consistently, athletes were preferred to nonathletes and although ability and effort could affect the level of desirability, these characteristics could not override the effect of athleticism.

As Carrington (1993) pointed out, the reactions of adolescents to those characters described as academically brilliant is of great significance. The results showed that brilliance at school can be desirable or undesirable depending upon the personal characteristics with which it interacts. Being brilliant is reasonably acceptable as long as one participates actively in sport. Whether that person is studious appears to matter little. However, the brilliant adolescent faces more serious social penalties if he/she is not sports-minded. If the brilliant nonathletes then apply themselves diligently to their studies their problems are compounded.

Cramond and Martin (1987) studied the attitudes of both preservice and inservice teachers in the same way that Tannenbaum (1962), Glover (1993) and Carrington (1993) studied the attitudes of adolescents. All four studies achieved remarkably similar results considering they involved different ages, cultures and time frames. Although it could be argued that the similarity of results between Tannenbaum (1962), Glover (1993) and Carrington (1993) were not altogether surprising, the results of the Cramond and Martin (1987) study raise some concerns as they seem to indicate that teachers (see Table 2.4 a) and preservice teachers (see Table 2.4 b) hold values pertaining to school work and intelligence similar to those of the students they teach.

Table 2.4 (a). Mean global scores: Inservice Teachers United States (N=82)
Cramond & Martin (1987)

Average Nonstudious Athlete	Brilliant Studious Athlete	Brilliant Nonstudious Athlete	Average Studious Athlete	Average Nonstudious Non-Athlete	Brilliant Nonstudious Non-Athlete	Average Studious Non-Athlete	Brilliant Studious Non-Athlete
31.5	29.7	27.3	20.7	12.4	11.8	11.7	5.8

Table 2.4 (b). Mean global scores: Preservice Teachers United States (N=100)
Cramond & Martin (1987)

Average Nonstudious Athlete	Brilliant Nonstudious Athlete	Brilliant Studious Athlete	Average Studious Athlete	Average Nonstudious Non-Athlete	Brilliant Nonstudious Non-Athlete	Average Studious Non-Athlete	Brilliant Studious Non-Athlete
40.7	39.8	39.3	35.7	31.2	29.9	28.7	26.3

As in the other studies the Cramond and Martin (1987) study of preservice and inservice teachers yielded statistically significant effects for athleticism ($F=181.16$, $p<.01$) but surprisingly studiousness was also found to be a significant main effect ($F = 9.27$, $p <.01$). Athletes were consistently preferred to nonathletes and nonstudious students were preferred to studious students. As in all studies the brilliant-studious-nonathlete (a classical stereotype of the gifted child) was rated the lowest.

Cramond and Martin (1987) noted little difference in terms of the way the experienced and the preservice teachers rated the eight stimulus characters. They also noted that the amount of experience and the gender of the teachers were not significant. As with Tannenbaum (1962), Cramond and Martin (1987) concluded there were no significant correlation coefficients between Scholastic Aptitude Test (SAT) scores and ratings, indicating that responses were independent of intellectual ability.

Cramond and Martin (1987) were surprised at the results that showed preservice teachers holding similar negative values to academic effort and asked the respondents if they could hypothesise why this might be so. The response offered was that the preservice teachers were responding in a similar way to the adolescents because they were not too far from being adolescents themselves and still thought much the same as they did.

It is easy enough to accept this rationale in terms of the preservice teachers, but how could this reasoning be applied to experienced teachers, some of whom as Cramond and Martin (1987) point out had over 21 years experience? Cramond and Martin (1987) thought that some of the experienced teachers with no special training may have felt uncomfortable with gifted students or that the teachers' values just reflect those of the society at large that does not value intellectual pursuit.

Regardless of the underlying causes of their attitudes, both the preservice and experienced teachers in the Cramond and Martin study did not value academic brilliance. These results have implications for the training of teachers at each of the preservice and inservice levels. Whether it is possible to modify attitudes by implementing courses during preservice training or through inservice courses appears unclear.

The results of the Cramond and Martin (1987) study, while interesting, need to be treated with a degree of caution as their sample size was small (83 experienced and 100 preservice teachers), only two universities were used and the sample of experienced teachers included only three males. The fact that all experienced teachers were undertaking postgraduate study also causes some concern. However, the major flaw would appear to be that the Cramond and Martin study, as did those of Tannenbaum (1962), Glover (1993) and Carrington (1993), assumes that all traits used in obtaining a mean global score are of equal weighting. None of the studies of Tannenbaum (1962), Cramond and Martin (1987), Glover (1993) and Carrington (1993) offered any meaningful data on the issue of gender.

Gender issues

According to Ayles (1992) and Piirto (1994) there is ample research to demonstrate that gender differences in education do exist. The major areas they identified were in the areas of achievement, test performance and course-taking. Most significantly they established that both parents and school personnel have different attitudes towards boys and girls and behave differently towards them. This has meant that the particular needs of gifted girls may not be well recognised and their abilities may not be promoted.

Ayles (1992) concluded that most teachers have a lower expectation of girls than boys and that girls have a lower opinion of their abilities than do boys. Kelly (1988) carried out a meta-analytic study examining gender differences in teacher-pupil interactions and concluded that most teachers have a lower expectation of girls than of boys and that girls have a lower opinion of their own abilities than do boys. Using research conducted in several countries Ayles (1992) concluded that in all school subjects with both male and female teachers, boys receive more instruction, praise and criticism. Although girls are just as likely to volunteer answers, boys are more likely to be chosen to speak.

Gagné (1993) was able to demonstrate that boys and girls are not perceived as equally proficient in many ability areas by either peers or teachers. Siegle and Reis (1995) established that teachers consistently rated females higher than males on the effort they put into their school work. Teachers also rated the quality of females' work higher. Their results showed that the student responses differed from the teacher responses. They found there were no significant differences in the way male and female students rated themselves on the effort they put into their work.

Freeman (1993) found that parents differed in their perceptions of success, attributing success in boys to ability and in girls to effort. This perception would appear to have been picked up by children also as Freeman (1993) found that gifted boys attribute their success to ability and effort and gifted females look upon it as something outside their control yet accepted defects as their own faults. Gifted boys attribute success to ability and failure to lack of effort and gifted girls attribute success to luck (Reis 1987) or effort (Rimm 1991) and failures to lack of ability (Reis 1987).

While Johnson and Lewman (1990) found that stereotyped perceptions of differential abilities and interests are in evidence before children begin school. However, Siegle and Reis (1995) argued that before the age of ten, children usually are unable to distinguish between ability and effort and that it is not until they approach adolescence that the ability to discriminate between them occurs. At this time gender differences start to become more pronounced. Davis and Rimm (1985) concluded that from early adolescence peer expectations play a very strong part in directing achievement. They found that girls risk being considered inferior if they become too involved in school achievement and that teachers respond to poor performance in girls as a lack of ability and in boys as a lack of effort.

Siegle and Reis (1995) were also able to show significant differences between ratings of male and female ability. Females are clearly perceived by classroom teachers as working harder and producing higher quality work than males. One might assume that females would also receive higher grades, since they produced higher quality work but this was not statistically supported with the gifted students in the Siegle and Reis study. Boys and girls received similar grades in all content areas except language arts. This is an area that needs further investigation, for if teachers believe that gifted girls are producing higher quality work, why are they not giving these girls higher grades?

In the Siegle and Reis (1995) study, teachers did not report a difference in the ability of gifted male and female students in any of the four content areas. This finding may represent some progress with educators, regarding gifted girls' abilities in the areas of mathematics and science. However, the same positive conclusion cannot be drawn about girls' perceptions about their own abilities. Gifted boys in the Siegle and Reis study reported stronger beliefs about their own abilities than did gifted girls in mathematics, social studies, and science. This is an area of concern because gifted girls are apparently still not recognising their abilities in these areas to the same extent as gifted boys. It is possible, however, that gifted boys may have overvalued their own abilities. A key factor in keeping gifted girls involved in higher-level mathematics and science courses is their self-perception of ability. One factor that clearly undermines gifted adolescent girls' self-esteem is their belief that high ability means achieving good grades effortlessly (Silverman, 1993). It would seem that students believe that if they must study hard then they must lack ability.

While the teachers in the Siegle and Reis (1995) study viewed ability and effort as being highly associated with the quality of work that students produced, students do not share that view. Males and females alike reported a much stronger relationship between ability and quality of work than between effort and quality of work, indicating that they may be putting little effort into their work. This would seem to indicate that students may be viewing ability as a major factor in the quality of their work instead of understanding that ability, without effort, will not result in the realisation of their high potential.

Jacobs and Weisz (1994) found that teachers have the potential to play an effective role in overriding the effects of gender stereotypes by giving girls frequent, positive and accurate feedback. Teachers need to be aware of their own gender-stereotyping as Kerr (1991) found that gifted girls received treatment from teachers that is more negative, less encouraging of their aspirations and less encouraging of their taking advanced mathematics courses than that accorded their male counterparts.

Jacobs and Weisz (1994) offer a number of research studies as evidence that even though teachers do give more attention to boys they do want to teach in a manner that does not differentially impact. They also contest that it is possible to increase nonsexist teaching among teachers even after relatively short training sessions. Jacobs and Weisz (1994) concluded that training teachers to identify and encourage particular abilities in gifted girls may have substantial benefits in terms of reducing the transmission of gender stereotypes to their students.

Jeon and Ristow (1992) found teachers in the United States tend to view gifted females positively. The Jeon and Ristow study requires closer scrutiny as the results may not be applicable to all teachers, because their sample was not representative. The teachers were predominantly female, worked in a rural setting, and worked directly with gifted girls. The sample size was 98 and represented only 56% of those surveyed.

The results of a study by Piirto and Fraas (1995) indicated that one cannot talk about gifted adolescents without talking about gender, that is, the gifted girls tended toward traditionally masculine characteristics such as tough-mindedness and dominance, indicating self-reliance, aggressiveness, and competitiveness. The gifted boys had traditionally feminine characteristics as tender-mindedness and submissiveness, indicating sensitivity and intuition.

Both the gifted girls and the gifted boys showed similarities in the dimensions of leadership, school achievement, extroversion, anxiety, and creativity, with no significant differences apparent. They found that these gifted girls, whether or not they possessed talents in the various domains, were already socialised into the "average", and displayed no extremes in personality. However, their study appears somewhat flawed due to the very small sample size of only 48 students, 30 females and 18 males.

Cooley, Chauvin and Karnes (1984) compared the attitudes of male and female teachers towards gifted female students and found that perceptions regarding gifted females were changing. Male teachers surveyed still had a tendency to view female students in a more traditional manner than did female teachers, but they did see gifted females in occupations and professions that were previously closed to women. The data indicated that male teachers perceived the gifted female student as more emotional, more highly strung, and more gullible than did the female teachers. Male teachers also had a tendency to view the gifted female student as less imaginative, less curious, less inventive, less individualistic, and less impulsive than did the female teachers.

Piirto (1994) saw that gender differences are apparent throughout a child's schooling and found that children assimilate gender expectations early. Butler-Por (1993) cautioned that negative societal influences contributed to the onset of under-achievement in girls and that every effort must be made to prevent sex-stereotyped attitudes which begin to emerge in the family and early educational frameworks. Piirto (1994) produced evidence that parents and teachers have different attitudes towards gender socialisation, concluding that the beliefs and behaviours of parents, teachers, counsellors, and peers are critical. These socialisers appear to lack confidence in gifted girls' ability or motivation to succeed at demanding educational programs. Piirto (1994) argued that there is little basis for gifted girls to develop non-traditional goals if their parents, teachers, and counsellors do not encourage them to consider these options, and support them once they do make these choices and there is less basis if these socialisers actively discourage such consideration.

Ayles (1992) argued that unless the effects of gender stereotyping are taken into account, measures to improve education for the most able will fail and the inequities created by attitudes and practices which foster gender inequality will be perpetuated. Kitano and Kirby (1986) believe teachers need to be inserviced on the special needs of gifted girls and made aware of the subtle unintentional ways in which sex stereotyping occurs in schools.

While Ayles (1992) reviewed the scene in the United Kingdom and Piirto (1994) in the United States, the situation in Australia would appear to be similar, as evidenced by the 1988 Report of the Senate Select Committee on the Education of Gifted and Talented Children. The report concluded that while there was little evidence to confirm that gifted girls were discriminated against, there was evidence to show that girls and boys were choosing different subjects to study. It would appear that girls tend to study the humanities and to be relatively unsuccessful in mathematics and science. The report also concluded that the reason for this may be due to the attitude of teachers, who were said to spend more time with the boys than the girls.

To understand the dampening of aspirations in gifted young women requires an awareness of the societal measures that become incorporated into feminine self-concept. While the image of young primary school gifted girls is encouraging, this pattern of positive female self-esteem appears to undergo a radical shift during adolescence. Howard-Hamilton and Robinson (1991), in contrast to Piirto (1994), stressed that many young girls, confident and secure prior to pubescence, became confused during adolescence when they began receiving social and cultural messages with strong gender role implications.

As girls reach puberty, gender-role socialisation makes its mark on their self-concepts, telling them that they are mainly valued for their appearance and sociability. This changes the priorities of gifted girls; since they are less valued for their achievements than for their attractiveness, they place less value on those achievements themselves (Silverman, 1993). These results support the premise that gifted adolescent girls have lower self-esteem than their non-gifted age cohorts, and that the girls' conceptions of themselves modify as they mature.

Lovecky (1995) established that over half the girls in her study began to underachieve as a means of coping with social pressures placed on them. The remaining girls continued to achieve but suffered socially because of their giftedness. Few were able to manage both manifesting their giftedness and dealing with peer pressure. Silverman (1995) was able to demonstrate that an equal number of gifted boys and girls are found from early childhood until the age of 12, even in the upper regions of giftedness — beyond 180 IQ. However, 98% of the pre-eminent adults are male. The turning point for gifted girls appears to be adolescence. During this complex period of development, giftedness must struggle to survive amidst strong societal messages that undermine gifted girls' confidence and motivation. Valued for their appearance rather than their abilities, gifted young women often limit their aspirations as they learn to adapt to traditional feminine roles in society. Reversing this accepted pattern will require a vigorous campaign to establish gender equity in the schools.

Kelly (1993) states that although gender still influences career self-efficacy, it is considerably less influential than academic achievement and that real progress has been made by young women in surmounting the repressive effects of gender socialisation on occupational self-efficacy and interest. Lubinski, Benbow and Sanders (1993) agree, stating that over the last 30 years in the United States, many of the barriers preventing gifted females from achieving their educational potential have been removed. They qualify this belief by adding that pronounced gender differences still remain in the area of the physical sciences in both educational and vocational areas. Freeman (1993) found the same to be true in Britain. Callahan (1991) concluded that gifted females are still treated inadequately, are not achieving as they could and are not choosing careers commensurate with their abilities.

If progress has been made Kelly (1993) argued it should not be attributed too quickly to the educational efforts of teachers and counsellors promoting gender equity in career choice and preparation. It is likely that young women believe they can successfully prepare to become accountants, mathematicians, and school administrators because they personally know women pursuing these occupations. The fact that significant numbers of women have entered these occupations over the past decade means that there are many more successful women to serve as models for young women than there were a generation ago. Kelly (1993) argued that vicarious observation by young women of the rewards professional women have received in these occupations is likely to have raised personal efficacy expectations. Young women are likely to believe they can do something if they see it done by women.

As Kelly (1993) acknowledged, caution is warranted in the interpretation of his results. As stated earlier, self-report measures are subject to social desirability effects and participants may have given the socially desirable response to the self-efficacy measures rather than their most honest assessment of their personal efficacy expectations. Kelly concluded this may be particularly true for gifted girls. Another limiting factor of Kelly's study is its homogeneous population. All participants attended the same school. These findings remain to be replicated with a more heterogeneous group.

Attitudinal issues

In 1963 Wiener and O'Shea noted that for a long time there had been concern about the effects of teacher attitudes on the learning of pupils. Wiener and O'Shea (1963) also examined the attitudes that teachers held towards gifted students and found a significant relationship between the scholastic aptitude of the teacher and the attitudes towards gifted students. The more study the teacher had undertaken, the more positive they were. They also concluded that exposure to gifted students improved teacher attitudes so that they were more positive towards gifted students. When examining the attitudes of university students Wiener and O'Shea (1963) found that gender was significant in that female students were more positive than males. Students in their final year of study were the most positive and it appeared that exposure to lectures about the gifted led to more favourable attitudes towards gifted students.

Wiener and O'Shea (1963) concluded that familiarity with and understanding of the gifted affects attitude in a positive way and that teachers who go on to postgraduate study are likely to be more favourably disposed toward the gifted. With regard to university lecturers, Wiener and O'Shea (1963) concluded their attitudes varied widely toward gifted children but are generally less favourable than school administrators and supervisors. They stress this is a major concern given that unless favourable attitudes are held by those who most directly influence the attitudes of preservice teachers, improvement in these attitudes and understanding will be limited. Caution is required when interpreting these results as the university lecturers were not all from an education background. It is interesting to note that Wiener (1968) also found that school psychologists who had experience with gifted children in gifted programs were more positive toward gifted children than those who had not had any experience. It was also found that female psychologists were more positive than males.

Jacobs (1972) found that kindergarten and first grade teachers had negative attitudes toward gifted children and that teachers may not be aware of their negative attitudes. They saw this as the beginning of society's intervention to say to the gifted that their ability would be more appreciated if it was average. The study concluded that teachers' attitudes reflected more general societal attitudes that giftedness was not a positive attribute and that in order to adjust best to the world gifted children should learn to hide their abilities so they will present as more acceptable.

Panda and Bartel (1972) found that teachers with specialised training perceived exceptional children in a relatively favourable way compared to teachers having no such experience or training. Dettmer (1986) was able to establish that the training of teachers is essential to improving programs for the gifted and in turn to improve teacher attitudes to gifted students. Dettmer (1986) was also able to demonstrate that university lecturers have a key role to play as change agents and their involvement in inservice education in the schools is essential as they are already well placed to influence undergraduate students and as a result improve the students' attitudes toward gifted individuals. Dettmer (1986) concluded that college undergraduates preparing to become teachers need exposure to courses in gifted education after students described the gifted in the following terms: weird, eccentric, wears glasses, uncoordinated in sports, get what they want, too smart for their own good, boring, awkward, discipline problem, hyper, a boaster, often depressed and suicidal, over-productive and a smart-ass. Tomlinson (1986) agreed about the importance of training teachers but found that teachers have a variety of expectations for inservice experience and their needs are varied due to differing experience and exposure in the field of gifted education. According to Tomlinson (1986) there is evidence also to indicate that inservice educational experiences spanning a wide range of grade levels are not as helpful as those aimed at a specific grade level or subject area.

Bransky (1987) studied the attitudes of administrators, gifted program teachers, and regular program teachers about the gifted education program in their schools and found the regular program teachers' attitudes to be the least favourable. The findings showed a strong correlation between regular program teachers' knowledge about specific aspects of the program and their attitudes toward the program. Bransky (1987) found that groups in closest day-to-day contact with gifted individuals (parents and teachers of gifted children) held significantly more favourable attitudes than did regular program teachers, administrators, and the general public and suggested that providing information about the nature and needs of gifted individuals would result in more favourable attitudes. It is interesting to note that they did not recommend providing opportunities for direct experience with gifted students as well.

Nicely, Small and Furman (1980) agreed with Bransky (1987), demonstrating a positive correlation between self-reported general knowledge about gifted children and about gifted education programs (through university courses, reading, inservice) and reported attitude toward having students leave their classrooms to participate in a gifted education program. Reis (1982) cautioned there was another factor to consider in that classroom teachers were negative towards gifted programs as they remove the best and brightest children from their classes. This notion was not supported by Feldhusen and Sayler (1990) who concluded that special classes for the gifted were supported by teachers and parents and that generally, children in these special classes had their academic, social and emotional needs catered for.

Bransky (1987) concluded that there is a strong correlation between specific knowledge about the program and the regular teacher's attitude toward it, when the possibly confounding factor of daily scheduling problems is not present. The correlation between knowledge of program aspects and attitude toward the gifted program suggests that open communication and sharing of information about gifted children and the special programming are basic to acceptance and support.

Smidchens and Sellin (1976) studied the attitudes of graduates in education towards gifted children. They chose to define attitude in terms of behaviours such as support for services for gifted children, wanting to teach gifted children and interaction of one's own average child with gifted children. Their study concluded that gifted learners were generally viewed favourably, with males more positive in terms of willingness to have gifted children interact with their own children. In terms of the respondents' desire to teach gifted students, Smidchens and Sellin (1976) found that gifted children were viewed positively but were not thought to be a high priority for special attention. Their results showed that the gender of the preservice teacher and whether they were primary or secondary were not significantly related to attitudes held. The study concluded that there was a need for special training for teachers who work with gifted children or who have them in a regular class as their findings showed that classroom teachers are not necessarily more positive about gifted students simply by having them in their class. The need for training was also supported by their finding that preservice teachers believe that gifted children do not have any special needs as learners. The composite image portrayed by Smidchens and Sellin (1976) is that gifted children are seen to possess admirable behaviour traits and are generally desirable to teach.

Guskin, Peng and Majd-Jabbari (1988) examined the attitudes preservice and inservice teachers held about giftedness and found that results for both groups were similar, which would suggest that their beliefs regarding gifted students are learned relatively early and are insensitive to experience or that experience is consistent with these preconceptions. The teachers in the Guskin, Peng and Majd-Jabbari study were not teachers of gifted students which does warrant noting. Guskin, Peng and Simon (1992) found that differences in gender, race and social class will act to modify teachers' reactions to ability and that experienced teachers react differently from preservice teachers. The direction of this influence was a contrast effect rather than a simple biasing effect. That is, when the student has background characteristics which are popularly associated with certain abilities (eg. black male athletes, females with high verbal and social skills), the abilities are given less significance. The differences found between experienced and preservice teachers' perceptions in the Guskin, Peng and Simon study may have been due to the experienced teacher sample being drawn from only one specialised school. Hanninen (1988) found that teachers who had a background in gifted education responded very differently to scenarios of gifted students than either preservice teachers or teachers without a background or experience in gifted education.

Busse and Dahme (1986) carried out a comparative study of teachers from West Germany and the United States and found that gifted students were seen to be more popular and achievement oriented in the United States. German teachers saw the gifted as slightly more self-centred. The Busse and Dahme (1986) study showed that while there were some differences in the way that teachers viewed gifted males and gifted females in both countries there were many more similarities than differences. Busse and Dahme (1986) concluded that generally teachers in the United States and Germany perceived gifted students to be well adjusted, but also acknowledged that their findings, due to design flaws in their study, probably underestimate the degree to which teachers attribute negative characteristics to gifted students.

Unlike the findings of Guskin, Peng and Maid-Jabbari (1988), Copenhaver and McIntyre (1992) identified significant differences between teachers who were experienced gifted education teachers and those who were not. Copenhaver and McIntyre (1992) found that the significant perceptual differences identified appeared to be related to grade level taught and whether teachers have taken courses or workshops on gifted education. The overriding implication is that effective teachers of the gifted need more grade-specific preservice and inservice course work and involvement with gifted students.

Hansen and Feldhusen (1994) found that it was generally accepted that typical preservice teacher training programs do not adequately prepare teachers to meet the needs of gifted learners. Similarly, Kagan (1992) reviewed 40 studies and concluded that personal beliefs, biases, and misconceptions remain firm throughout typical teacher preservice programs and determine later teacher behaviour in classrooms. Does teacher training in gifted eduction help teachers develop these important competencies? Evidence indicates that in several areas, it does. Previous research tells us that specially trained teachers can identify gifted children better than untrained teachers (Borland 1978; Jacobs, 1972) while trained teachers are supportive of gifted students and programs for gifted students whereas untrained teachers are apathetic and sometimes hostile (Wiener & O'Shea, 1963).

The results of this research suggest that teachers who get training in gifted education will develop the skills that have been deemed necessary by experts to teach gifted children effectively. Tomlinson (1995) found that veteran teachers trained to work with exceptional learners seem more tolerant of those learners than are colleagues who lack such training. This finding is also supported by Hanninen (1988), Starko and Schack (1989) and Morris (1987).

Tomlinson et al. (1994) believe that preservice teachers face formidable tasks of planning and management as they enter the classroom for the first time as professionals. They also found preservice teachers bring with them mental imprints of what teaching and learning are like, schema gained not from their professional preparation programs, but from their years as students.

Veteran educators without training in teaching exceptional students appear to be less tolerant of such students than are educators who have special training in exceptionalities (Copenhaver & Macintyre, 1992; Hanninen, 1988; Starko & Schack, 1989), although Panda and Bartel (1972) found that beyond a certain level of awareness, training does not appear helpful in changing veteran teachers' perceptions about exceptional students. Preservice teacher attitudes may also correlate positively with their knowledge of gifted students (Morris, 1987; Nicely et al., 1980). The amount of knowledge a preservice teacher would have about gifted students is likely to be limited, unless they had undertaken some elective courses on this topic.

Nonetheless, many educators tend to view gifted learners in less favourable and more stereotypical ways (Cramond & Martin, 1987: House, 1979; Jacobs 1972) or to devalue educational programs or provisions for them (Colangelo & Kelly, 1983).

Larsson (1990) examined teacher attitudes on educational provisions for the gifted in New South Wales and the findings demonstrated a greater need for co-operation between schools and education faculties of universities in order to assist in the fostering of positive attitudes of teachers. It was suggested that this would be best achieved by inservice workshops and courses. Larsson (1990) saw a major problem with teacher identification of gifted pupils and the attitude of individual teachers to the concept of giftedness. Where it is the responsibility of schools to make provisions for their gifted students it becomes particularly important for teachers to accept that within their schools they should be catering for at least 10-15% of pupils in a positive way by providing special programs.

Larsson (1990) identifies a problem with the use of attitudinal surveys in that they sometimes fail to discriminate between attitudes towards labelled children and attitudes towards the gifted program. It is an untested assumption that persons who are negative about providing special services to gifted children are also hostile towards the labelled children themselves. Larsson (1990) recommended the use of multivariate studies to investigate gifted children, their school peers, teachers, siblings and parents simultaneously.

Gross (1994) states that the attitudes which teachers and community members hold toward children with special needs have a profound influence on the degree to which the educational community is willing to assist these students. Larsen, Griffin and Larsen (1994) found there is strong public support for the programs that address the special needs of gifted students, especially if those programs do not reduce what is offered to average or slow learners, but this surprising result may be due to the research findings being based on a telephone survey of parents with school-aged children, over a third of whom had a child labelled as gifted.

Gross (1994) was able to demonstrate that strong positive changes in teacher attitudes to gifted children can be effected through carefully planned and well-conducted professional development programs even though at the start of the course participants' attitudes to gifted education were much more positive than could be expected to be found amongst regular classroom teachers. When considering the results of both these studies it needs to be kept in mind that the samples may be somewhat skewed, as Gross (1994) acknowledged. Nevertheless, Wiener and O'Shea (1963) drew similar conclusions from their study of a much wider sample of subjects.

Gross (1993) argued that Australia has little chance of developing first-rate programs for gifted students until we rid ourselves of what she saw as our national intolerance of intellectuals. Gross (1993) cites historian Katherine West's example that while Australia has allowed itself a number of sporting heroes, and some in the corporate arena, we have rarely, if ever, allowed an intellectual hero. Such a situation is in contrast to North America and Europe where some intellectuals are household names.

Bailey and Sinclair (1990) studied the attitudes of Australian preservice and inservice teachers, university lecturers and parents towards the education of gifted students. They undertook the study in response to the lack of available evidence about the views held by significant groups in the education of gifted students and because there is very little sound, empirically derived information to guide policy makers in this crucial but largely neglected area of Australian educational provision (Bailey & Sinclair, 1990).They concluded that the existing body of research appears to reveal a social climate that discourages mental development beyond a certain point. Some caution is required with the findings of Bailey and Sinclair's study as the parents surveyed were not a representative sample because they all claimed to have a gifted child of their own.

Attitudes and their measurement

Fishbein and Ajzen (1975) suggest that the term 'attitude' is characterised by an embarrassing degree of ambiguity and confusion, and identify three essential features of attitude: attitude is learned, it predisposes action, and such actions are consistently favourable or unfavourable toward the object. In an effort to understand attitude in relationship to other elements of the affective domain Anderson (1981, p. 421) began by delineating the essential features of affective characteristics in general. He identified five such characteristics:

(a) *Emotion.* Affective characteristics involve primarily the feelings and emotions of persons. Affective characteristics typically are contrasted with cognitive characteristics (which primarily involve knowing and thinking) and psychomotor characteristics (which primarily involve acting and behaving . Since an attitude is an affective characteristic it also involves a person's feelings and emotions.

(b) *Consistency.* Consistency differentiates affective characteristics from affective reactions induced by particular situations or settings. A reasonable degree of consistency of responses is necessary before it can be inferred that a person possesses a particular affective characteristic. If a great deal of inconsistency of responses is noted, it may be suggested that the person does not possess the particular affective characteristic being sought. Rather the responses are determined more by factors external to the person than factors internal to the person.

(c) *Target.* Affective characteristics are related to particular objects, situations, ideas, and experiences. These objects, situations ideas, and experiences can be subsumed under the general label of target. All emotions and feelings, including attitude, are directed toward (or away from) some target.

(d) *Direction.* Given a target, affective characteristics prepare people to approach or avoid it. Hence, direction is an essential feature of affective characteristics. Direction is concerned with the positive or negative orientation of the emotions or feelings toward the target. Differences in orientation are typically expressed in terms of bipolar adjectives which indicate the opposite directions.

(e) *Intensity.* Intensity refers to the degree or strength of the emotions or feelings. Intensity is an essential feature of affective characteristics; some people experience more intense emotions than other people. Similarly, some emotions are more intense than other emotions. Hate, for example, is a more intense emotion than dislike.

Anderson (1981) concluded that the differentiation of attitude from other affective characteristics is possible only if the characteristics of target, direction, and intensity are considered. As proof of this he explains that the most common target of attitude is an object, frequently a social object, and thus attitude differs from other affective characteristics in terms of target because the targets of other related affective characteristics such as interest, values and self-esteem include activities, abstractions, and perceptions of self. The targets of attitude are most likely reasonably concrete, social objects.

Attitude also can be differentiated from other affective characteristics in terms of direction, according to Anderson (1981). He argued the directional indicators of attitude are favourable and unfavourable while other affective characteristics are associated with other directional indicators as in the case of interest where the indicators are uninterested and interested. Anderson (1981) declared also the directional indicators for preference are in fact the targets themselves, while the directions indicated by preferences are toward one target and, by definition, away from another target. For self-esteem the directional indicators are negative and positive, or worthless and worthy.

The final way Anderson (1981) explains that attitude can be differentiated from other affective characteristics is in terms of intensity. He surmised it can be inferred that attitude is an emotion of moderate intensity and is more or less a reactive emotion. This implies that when an object is encountered by an individual, an attitude is activated. Anderson (1981) argued that several affective characteristics, such as values, are more intense than attitude. Anderson (1981) defined an attitude as a moderately intense emotion that prepares or predisposes an individual to respond consistently in a favourable or unfavourable manner when confronted with a particular object. Anderson (1981) saw attitude as a fairly specific affective characteristic with unique features and that should not be equated with the general concept, affect.

In terms of the measurement of attitudes, Anderson (1981) explains there are three generally accepted methods, all of which involve the researcher making inferences about attitude from some form of observable indicator. It is possible to draw inferences using scales that ask individuals to respond to a survey, by gathering data on observable behaviour or by using data from physiological responses. Anderson (1981) saw the use of surveys and scales as the most prevalent and concluded it to be a sound method, provided issues of validity are addressed. Tannenbaum's use of a list of traits to establish attitudes is endorsed by McNair (cited in Lindzey & Aronson, 1969) who defined an opinion as a belief measured by a single item, whereas an attitude is a belief measured by an inventory or battery of items.

Australian policy

In order to understand better the pu pose of the current study an examination of the history of educational policy develop ent regarding the gifted is required. Such a review enables the current attitudes of educat rs and future educators to be viewed in perspective.

Braggett (1985) carried out a thoro gh study of the series of events between 1940 and 1975 that had impacted upon gifted ed cation policy in Australia. He concluded that in the early 1970s educational provision for gifted children was not a popular cause to pursue in a nation that decried special attention to academic precocity and equated giftedness with privilege. Braggett (1985) explains that by 1975 the Federal Labor Government was concerned with correcting what were seen as social injustices. There were funded projects aimed at assisting the disadvantaged and programs aimed at equalising education for all. The prevailing goal of the Federal Government policies, he surmised, was to assist disadvantaged children within an egalitarian framework, and gifted children were not acknowledged to be needy or handicapped. He argued that any realignment of policy in favour of gifted children might be denigrated as elitist.

It appeared that none of the states at that time had any long-term policies in place for the provision of education to gifted children. Indeed Braggett (1985) cites a 1976 meeting of all Australian Directors-General of Education at which reports from each of the eight states and territories together with a paper from the Commonwealth Schools Commission were reviewed. In general, states reported no official policies on the education of the gifted and few programs. Braggett (1985) observed that the Labor Party's policy and the Schools Commission's direction during its early years had contributed to a trend against gifted education.

Gross (1993) saw the extreme egalitarianism which characterises Australian society as having its origins in the country's beginnings in the late eighteenth century as a penal colony. The class structure led to hatred of authority, privilege and intellect which were largely seen as inherited rather than acquired through honest labour. If Gross' theory of intellectual giftedness being equated with social and economic privilege is true then the resulting distrust and resentment of the intellectually gifted will be significant. Gross (1993) saw a national resistance to anything in the academic arena that can be construed as elitism and a genuine fear that if one fosters the individual talents of students, one will do a disservice through setting them apart from the peer group.

The views of Gross (1993) would appear to be supported by Goldberg (1981) who wrote a detailed report on the state of Australian educational provisions for gifted students. Goldberg found that the major obstacle preventing gifted students from accessing the provisions needed was the attitude among educators and the general public that the ability to get along with everyone was of major importance and the fear that school procedures which single children out as more able than the generality might jeopardise their sense of identity with, and acceptance by, the common man (sic).

Passow (1993) argued that a shift in attitudes towards the education of the gifted occurred in Australia in the 1980s and theorised that this may have been the result of Goldberg's visit to Australia and subsequent report in which she stated that in Australia there was a general ambivalence towards the education of gifted students (Goldberg, 1981).

The Australian Schools Commissic n (1980) issued a discussion paper titled *The education of gifted students* and Braggett (1985) concluded that the Schools Commission has played a pivotal role in the develoɼment of policies and projects designed to enhance the cause of gifted education within A ıstralia. The Australian Schools Commission's report dealt with a wide range of issue ; and suggested that Australia needed to address openly three important questions with ·egard to policy implications:

(1) Can the provision of specia educati ɹnal services for the gifted be seen as consistent with the goal of schooling b ɜing soc ially comprehensive?

(2) Can extra provision for gift ɜd students be regarded as equitable in terms of equality of opportunity and the encour gement of all children to achieve their potential?

(3) Are students with special ta lents re lly held back by the way their schooling is provided? (Australian Schools Comm ssion, 1980).

Passow (1993) noted that between 1978 and 1985, with the exception of Victoria, all states and territories had issued policy ɜtatements on the education of gifted and talented children. Braggett (1986) cautioned th t there was a great deal of difference between the various policy statements in terms of their con ent, quality and intention and even though he acknowledges that gifted education is a politically sensitive issue and that some policy statements are developed for political ɹeasons, he saw the mere existence of a policy document as an important milestone. I appears that the various states' policies regarding the education of the gifted were modif ed throughout the 1980s in response mainly to changes in government rather than an consist ɜnt trend in ideology Australia-wide.

In 1988 the Senate Select Committee on the Education of Gifted and Talented Children (hereafter referred to as the Senate Committee) spent two years visiting each state in Australia and examining the educational provisions for the gifted in order to table its report. One of the statements made to the Senate Committee (1988) was that the greatest barrier to be overcome before appropriate education can be provided for all gifted students may be the negative attitude of some teachers towards such students, and the opposition of these teachers to the making of special educational provision for the gifted.

Such a statement was endorsed by a Queensland government representative offering evidence to the committee, who had observed that one of the biggest problems was the attitude of principals and teachers towards the education of the gifted students. The Senate Committee (1988) heard evidence that the needs of the gifted were often talked about, but that principals and teachers were not actually making provisions in their schools and classrooms. The general argument offered was that schools have limited resources and that those resources should really be directed towards the non-achieving or under-achieving children (Senate Committee 1988, p. 104).

Evidence offered to the Senate Committee (1998) seemed to indicate that some teachers resent or feel threatened by gifted children, with parents advancing the theories that this occurs particularly in the case of the highly intelligent child, and that gifted children may be victimised by teachers. In a study by Skinner (1985) it was found that although teachers reported feeling quite comfortable with gifted students they showed signs of insecurity the more the gifted students contributed to the class. The lessons observed in the study were closely directed by the teacher and thus allowed the gifted students little opportunity to contribute or to interact with the teacher.

Bartak, of Monash University, gave evidence to the Senate Committee (1998) that his research had found that teachers often seem to be unwilling to promote children performing at their optimum levels because, in some way, they think it is unfair to other children if somebody is rewarded for high achievement. Start, of the University of Melbourne, provided the Committee with an example of this attitude, stating that he had witnessed an incident where a kindergarten teacher had refused to allow a little girl to write her name on her bag because it would hurt all the other children who could not write their names. Start argued that as a result of such an attitude the child who could write her name has learned that you do not learn to write because it will hurt people or, if you do, you do not tell anyone, thus the seeds of deliberate under-achievement have been sown (Senate Committee 1998, p. 105).

The Senate Committee heard evidence that an enlightened approach within the classroom may be more important for the education of gifted children than the allocation of material resources, an issue that many overlook in their haste to establish programs for gifted children in schools (Senate Committee 1988, p. 105). It was also argued that there was a need to change the educational philosophy and attitude of teachers by developing a willingness in teachers to accept the fact that the gifted child deserves an appropriate education. In doing this it is possible to achieve significant breakthroughs without any need for additional resources.

In evidence offered from research studies conducted in high schools in Western Australia it would appear that if teachers have had some experience of special programs for gifted children they become less antagonistic towards them (Senate Committee 1988, p. 105). Even though such a finding is encouraging, Carss, of the University of Queensland, cautioned the Senate Committee (1988, p. 106), that although a change in teachers' attitudes would be necessary for adequate provision to be made for gifted children, teachers would also need to acquire appropriate expertise. These comments were supported by the research findings of Wiener and O'Shea (1963), Panda and Bartel (1972), Smidchens and Sellin (1976), Nicely et al. (1980), Dettmer (1986), Tomlinson (1986), Bransky (1987) and Hanninen (1988).

As Gross (1993) pointed out, the Senate Committee recommended to the Federal Government that preservice teacher training courses should include sufficient information about gifted children to make student teachers aware of the needs of these children and familiarise them with appropriate identification strategies and teaching techniques. The Senate Committee also recommended that the professional development of teachers with special concern for girls, Aborigines and children from disadvantaged groups should include input on the identification and education of gifted children from these populations.

The Senate Select Committee also urged the federal government to make a clear statement that special educational strategies should be provided for gifted children throughout Australia. This was a cross-party committee representing every major political party in Australia at the time and yet it was able to present a unanimously endorsed report (Gross, 1993). The report argued that gifted children were among the most educationally disadvantaged in Australian schools. The federal government was slow in its response and merely placed the responsibility back onto the individual states to generate their own policy documents, though the National Equity Program for Schools (1993-95) was a significant boost, ensuring that approximately one million dollars a year over three years was made available for gifted and talented education.

The situation regarding policy on the educational provision for the gifted appeared to be heading in a more positive direction at the beginning of 1993. At this time all Australian states had policies relating to gifted and talented students (Braggett, 1993). In fact Victoria did not develop a state policy until 1995. Braggett acknowledged that while some were merely modified from previous years or relatively general and lacked commitment, others reflected a system concern that led to quality program implementation. Braggett (1993, p. 813) summarised the main policy provisions in each state at that time as follows (the New South Wales situation is detailed in a separate section).

In Western Australia specialised secondary school programs continue and are genuinely entrenched within mainstream provision; the part-time withdrawal programs for primary children continue with strong support, and a range of school-based programs operate throughout the state. A new policy has been developed and in operation.

Queensland maintains a supportive approach through a state coordinator of gifted and talented education and through regional consultants, who develop networks, organise cluster activities, provide inservice training, develop and distribute resources, organise specialist camps, and implement school programs and policies.

South Australia is re-asserting the needs of gifted students and developing new focus schools for those with high intellectual potential, an initiative to supplement the Special Interest Secondary Schools.

The Northern Territory, in addition to a system-wide identification program, provides special classes, permits accelerated progression in a number of different forms, conducts inservice education for teachers in regard to enrichment strategies, provides state-sponsored camps, and emphasises the special abilities of students from different ethnic groups, including the Aboriginal population.

Tasmania and the Australian Capital Territory (ACT) provide much less system direction and leave it to individual schools to develop their own programs. Tasmania has disbanded the special units which previously existed, moved consultants into other priority areas, and allowed the gifted and talented coordinator's position to lapse. The ACT has incorporated its consultancy service under the rubric of special needs.

In Victoria there is considerable activity at the school level where enrichment programs, extension schemes, excellence awards, and inter-school schemes operate. University High School, Melbourne, conducts a renowned academic acceleration program, and there are continuing ventures involving tertiary institutions and parent bodies. It would seem, however, that gifted education may not have enjoyed official publicity from the Ministry of Education in Victoria in recent years and that treasury-funded services have been reduced.

Gifted education policy in New South Wales

As the current study was undertaken exclusively in New South Wales a more detailed examination of significant historical policy developments is required. Education policies and programs concerning the education of gifted students have changed dramatically in New South Wales over the last two decades and the changes have been due in response to a wide range of social, economic and political forces (Hall, 1993). In spite of very active parent and educator movements that have fluctuated over the years, a New South Wales Departmental policy was not issued until the early 1980s, in response to a Schools Commission Inquiry. However, as Hall (1993) pointed out, this had minimal impact due to the political and educational climate at that time. Pressure remained and changing economic and social conditions saw both the State Government (see Appendix A) and the Department of School Education (see Appendix B) make public statements in April and November 1991, respectively.

The policy statement issued by the hen state government states that its purpose is to maximise the educational outcomes fo gifted and talented students by pursuing three prime objectives: to optimise the devel opment of the potential of each gifted and talented student, to promote the development o a flexible approach to the education of students with superior abilities, and to ensure the provision of opportunities for these students to be involved in a range of learning experiences that will develop a particular talent or a range of talents (NSW Government St ategy for the Education of Gifted and Talented Students, 1991). The policy offers a de finition and guiding principles and importantly makes clear statements about identifica tion and intervention strategies. To its credit it also addresses the issue of gifts and talents among the disabled and minority groups and outlines the composition of a ministeri al advisory council. The Board of Studies has its role clearly defined with regard to guiding curriculum and, probably most importantly, the policy outlines both system level ir plemer tation and desirable outcomes at the school level.

The Department of School Educati n issued a policy statement in November of 1991 and predicably it adopted the governm ent's definitions and was primarily designed to offer specific guidelines for the implementation of the overarching aims and objectives outlined in the government's documen issued earlier that year. It is encouraging to note that the Department of School Educati n policy statement recognises the multi-faceted nature of giftedness and that gifted and talented children are not a homogeneous group. Much responsibility is devolved to loc al school regions and communities, along with assertion of the need for a collaborativ e approach to decision making. As Braggett (1986) rightly pointed out, gifted education is a politically sensitive issue and some policy statements are developed for political reasons. Still, this document is positive and well-informed and most importantly gives a supportive framework in which researchers and practitioners can operate.

Braggett (1993) noted that since the change of government in 1989 new measures have been introduced to cater for the gifted and talented population. As evidence of this he cites the increase in the number of special schools, the introduction of specially designated classes in all regions, the creation of Centres of Excellence, support for early entry to school and accelerated progression, as well as the retraining of staff being made a priority. Additionally there are a number of selective schools and special classes which have been incorporated into the state's overall plan.

Hall (1993) found that these current policies review and address the issues at the centre of the debate and offer informed, current, researched directives and counsel. An overall philosophical statement is supported by practical strategies for educators from early childhood (including separate statements on early entry, home schooling and acceleration) to tertiary, acknowledging the critical factor of continuing provision for these children.

In the classroom there still would appear to be diversity of implementation, but as Hall (1993) explains, the continuing public debate will hopefully ensure that these policies and programs will be monitored, evaluated and updated to ensure adequate provision in the future.

As Hall (1993) explains, determining policy, a controversial undertaking at any time, has in recent years moved more towards the democratic decision-making process model where submissions are invited from all interested stakeholders. It would appear desirable that parents and educators work towards influencing the policy making process. With government in New South Wales changing again in 1995 it is too early at this stage to comment on any observable changes. It would appear that changes are on the government's agenda though there are indications that much of the previous policy will be maintained.

Summary

Gross (1994) noted that Australian attitudes towards the education of academically gifted students may be somewhat more negative than those in most other industrialised societies. She suggested that caution was required when interpreting many attitudinal studies, noting that many studies cited in Begin and Gagné (1994) had measurement or procedural flaws which seriously limit their ability to be generalised. The study of Begin and Gagné (1994) itself is flawed in that it claims to be a comprehensive review of available research concerning attitudes towards the gifted yet omits many important studies such as Tannenbaum (1962), Cramond and Martin (1987) and Kelly (1988).

Ultimately the studies reviewed must be scrutinised in terms of methodologies, and as Begin and Gagné (1994, p. 171) identify, there are four pre-requisites that a research study in the area of attitudes toward the gifted should satisfy. These are: (a) the adequacy of the measure of attitude toward giftedness, (b) the number, pertinence and appropriate measurement of the predictors, (c) the size, appropriateness and representativeness of the sample, and (d) the adequacy of the statistical methods.

In terms of measuring attitude, merely establishing the direction of general attitudes is not sufficient. The intensity of the attitude must also be ascertained. Tannenbaum (1962), Cramond and Martin (1987), Glover (1993) and Carrington (1993) failed to do this. Instruments must be reliable and valid and the studies of Tannenbaum (1962), Cramond and Martin (1987), Glover (1993) and Carrington (1993) were able to incorporate the use of a valid and reliable instrument that could generate a global score. Dettmer (1986), Badt (1957), Colangelo and Kelly (1983), Nicely et al. (1980) and Smidchens and Sellin (1976) all used measures that did not allow the generation of a general attitude score as they used only a few diverse items. The conclusions of Busse and Dahme (1986) and Jacobs (1972) were drawn from studies that concerned a different specific aspect of general attitude to giftedness, thus preventing comparisons between the studies.

The second condition that Begin and Gagné (1994) identified as important concerned the appropriate choice and adequate measure of the independent variables. The studies of Badt (1957), Dettmer (1986), Gagné (1993), Jacobs (1972), Bransky (1987), Busse and Dahme (1986) and Nicely et al. (1980) used only a small number of predictors. In order to explain a sufficiently large percentage of the variance in attitude, it is necessary to analyse simultaneously a fairly large number of explanatory variables, each of them measured with sufficient precision (Begin & Gagné, 1994).

As Begin and Gagné (1994) pointed out, the choice of sample size is essential if the results obtained in a study are to be generalizable. Samples have to be large enough to minimise measurement error, as well as representative of a population which is relevant to the construct studied, and sufficiently heterogenous to be of interest to a large segment of the professions in the field. It would appear that the studies of Bransky (1987), Colangelo and Kelly (1983), Dettmer (1986), and Cramond and Martin (1987) involve comparison groups which are too small.

The use of appropriate statistical methods is obviously crucial. Some researchers such as Badt (1957) and Jacobs (1972) only did a descriptive analysis of their data thus leaving open the possibility that some of their observations might reflect only random fluctuations. Other studies such as Tannenbaum (1962), Cramond and Martin (1987), Glover (1993) and Carrington (1993) failed to make full use of quantitative measures.

The present study was designed to address the concerns highlighted by Begin and Gagné (1994). It generates a global attitude score accounting for both the intensity and direction of the general attitude while using a reliable and valid instrument. Secondly, a number of explanatory variables are analysed simultaneously and each of these is measured accurately. The sample focuses solely on preservice teachers and was drawn from a number of universities, both urban and rural. All of the samples came from the one state so the issue of different states' educational policies does not confound the results. Another important aspect is that all data were collected within one governmental policy making period. The sample size is large enough to minimise measurement error. The statistical analysis, outlined in the following chapter, involves the use of both qualitative and quantitative procedures

Given the shortcomings of the literature reviewed it would appear that, subject to the cautions offered above, there are some clear trends that have emerged:

(1) Ability and effort are significant determinants when teachers, peers and society formulate attitudes about the gifted. The pivotal issue, though, appears to be how these traits interact with each other and with other personal and behavioural characteristics.

(2) Gifted children do learn to hide their abilities when presented with negative attitudes from parents, educators and the wider society. Females appear to fare worse than males although there is substantial evidence that the differentiation of attitude and treatment, if not yet outcomes, is being addressed successfully. Much of the research reviewed, recent though it was, could not possibly have taken into account fully the dramatic increase in awareness of gender discrimination issues that has occurred of late.

(3) Experienced teachers and preservice teachers may differ in terms of the attitudes they hold towards the gifted. However, these differences may have more to do with the amount of exposure they have had to gifted students, or training they have received in gifted education, rather than the number of years they have been teaching. Generally it would appear that increased exposure and training will lead to a more positive attitude toward gifted students. How and when to implement this training is an issue that appears to be contentious. Ideally it would appear to be desirable to begin training at the undergraduate level with preservice teachers and continue the process through inservice workshops and the provision of post-graduate courses.

(4) It would appear possible to delineate attitude from other affective characteristics. Further, provided certain conditions are met it would appear valid to measure and draw inferences about an individual's attitude using survey and scaling techniques. An attitude is a belief best measured by an inventory or battery of items, though caution is required with regard to differentiating between attitude to the gifted and attitude towards gifted programs.

(5) The situation regarding educational policy in Australia has improved in the last few decades to a situation where all states at least have a policy. The substance and implementation of, and support for, these policies vary widely from state to state. In New South Wales the policy document is positive and generally well constructed but the implementation of, and support for, its objectives are by no means universal. It would appear that a modification of the attitudes of significant stakeholders must precede any successful call for an increase in funding or redirection of resources.

This study offers an insight into the way our future educators view their students by examining Australian preservice teacher attitudes towards the ability, studiousness and gender of their prospective students, while also considering the gender, year of study and university attended of the preservice teachers.

CHAPTER III

METHODOLOGY

Overview

This chapter provides detailed descriptions of the methodology of the study, outlining the instruments used, the sampling plan, administrative procedures followed and the response rates obtained. An explanation is made of the analytical techniques applied, together with discussion of threats to validity and reliability. In particular a detailed explanation of the Rasch Rating Model is given and how it was utilised in the scoring procedures is demonstrated.

Social perception questionnaires eliciting preservice teachers' views of hypothetical primary and secondary school aged students were administered to a sample of 1470 preservice teachers. There were two types of questionnaire and both were administered at the same time, with each respondent having to complete only one. Of this total of 1470, 942 were primary preservice teachers, 108 of whom completed the Likert scale questionnaire and 834 the questionnaire responding to the hypothetical students. Of the 528 secondary preservice teachers, 56 completed the Likert scale questionnaire and 472 the questionnaire responding to the hypothetical students. Due to responses containing errors and omissions not being included in the analyses, the primary preservice numbers were reduced to 105 and 776 and the secondary preservice numbers were reduced to 53 and 450 respectively.

One questionnaire required dichotomous "yes"/"no" answers in respect of a list of 54 traits that were descriptive of eight different kinds of student. There were two sets, one for primary preservice teachers (see Appendix C) and one for secondary preservice teachers (see Appendix D). The students described in the social perception questionnaire represented all eight possible combinations of gifted/average, studious/nonstudious and male/female: gifted-studious male, gifted-studious female, gifted-nonstudious male, gifted-nonstudious female, average-studious male, average-studious female, average-nonstudious male and average-nonstudious female.

The other questionnaire required preservice teachers to assess the desirability of the same 54 traits, using a six-point Likert scale, with the objective of deriving a scale of trait desirability. Again there were two sets, one for primary preservice teachers (see Appendix E) and one for secondary preservice teachers (see Appendix F). This scale provided weightings of trait desirability that were used in scoring responses from the dichotomous questionnaires and in computing interval measures of the preservice teachers' social perceptions of the eight types of student.

At the same time the groups of primary and secondary preservice teachers were completing the Likert scale, another group of primary and secondary preservice teachers were asked to read a description of a hypothetical student and decide if the same list of traits was descriptive or not of that student. Based on the yes/no responses and using the information obtained from the Likert scale data about trait desirability weightings, it was possible to compute a global score of desirability for each hypothetical student. The scoring procedure used was very complex and is outlined in detail later in this chapter.

The subjects responding to the questionnaires were drawn from five universities, distributed over all four years of various preservice teacher education degree programs and categorised by gender. As previously mentioned, the stimulus "objects" that the subjects were exposed to were characterised by the attributes of ability, studiousness and gender. Hence, for analytical purposes the investigation was conceptualised as two fully factorial studies. One study examined primary preservice teachers' perceptions of primary school-aged students and the other secondary preservice teachers' perceptions of secondary school-aged students. Each study had six factors: respondent's university (1), year of study (2), gender (3), and stimulus character's ability (4), studiousness (5) and gender (6). A series of four-way analyses of variance was carried out rather than one six-way analysis of variance. Difficulties of interpretation of interaction effects increase exponentially beyond three or four independent variables. This procedure was carried out on both the primary preservice teacher data and the secondary preservice teacher data.

In order to answer the six research questions the basic statistical procedure used to analyse data was a series of ANOVAs using preservice teacher ratings as the dependent variable. Specifically, a three-way ANOVA was carried out to test for the effects of student gender, ability and studiousness, and three four-way ANOVAs were conducted to detect the effect of the preservice teacher attributes of gender, university attended and year of study, as main effects and as interactions with the student attributes. Such a procedure allowed for the examination of the attributes independently and as they interact in each case.

The three-way interactive effect was further explored using a set of planned single degrees of freedom comparisons. Planned comparisons were used in preference to post-hoc procedures because those procedures, in order to protect against an escalating type one error rate, are conservative and hence of low power (Hays, 1969). Similarly the set of planned comparisons was restricted to those of direct relevance to the present research; that is, an exhaustive set of all possible comparisons was not carried out. Nevertheless, in order to protect against a type one error, a pairwise alpha level of .005 was set to indicate statistical significance. Assuming a set of ten pairwise comparisons each at an alpha level of .005, a familywise alpha level of .05 would be achieved. This procedure of using planned comparisons was used to investigate all high-order interaction effects.

Sampling Plan

Survey research in education usually involves the collection of information from members of a group of students, teachers, or other persons associated with the educational process and the analysis of this information to illuminate particular educational issues. As generally it is not possible, logistically or financially, to survey all of the identified group most surveys are based on samples of a specified target population, the group of persons in whom interest is expressed. The aim of most research studies is to be able to generalise the results obtained from the samples to the populations from which the samples were drawn. With this in mind it was necessary to define the target population carefully prior to preparing plans for selecting respondents in order to set the administrative limits for the study, as well as to specify the population to which the results of the study may be generalised. In the case of this study the focus was the attitudes of preservice teachers and the target group was specifically primary and secondary preservice teachers in New South Wales.

Surveys are often designed to examine relationships between various factors, typically seeking to explain differences between respondents on some criterion. In terms of this study such factors as the university attended, the year of study and the gender of the primary and secondary preservice teachers were being examined.

Underpinning surveys are conceptual models which the researcher wishes to test, with the aim of improving understanding of the network of factors influencing educational processes. In this case the desired outcome was a greater understanding of primary and secondary preservice teachers' attitudes towards ability, effort and gender so that evidence might be provided of the need or otherwise for modification of educational policy and practice concerning gifted children specifically.

The selection of respondents from the target population was based on random sampling of students within specified year groups from five universities in New South Wales. It was then possible to use data derived from the sample itself to estimate statistical characteristics of the population. The sample and the population are linked by the sampling error which may be derived from the sample data. It is important to note that the sampling error depends primarily on the size and structure of the sample, not on the size of the population or the proportion of the population sampled. In order to decrease the sampling error the universities were chosen so as to have a balance of smaller and larger universities, urban and rural settings and on the number of primary and secondary preservice teachers enrolled in courses. A gender balance was not possible, or indeed desirable, as there are far more females enrolled in preservice teacher education courses.

Information was obtained from preservice teacher education students attending both rural and urban universities: Charles Sturt University, Newcastle University, the University of New England, the University of New South Wales and Wollongong University. One thousand four-hundred and seventy preservice teachers were surveyed (see Table 3.1). To ensure confidentiality, the universities will henceforth be referred to only as A, B, C, D and E. The order does not correspond to those listed above.

Table 3.1. All preservice teacher respondents. N=1470

	University A	University B	University C	University D	University E	**Totals**
Female	196	130	298	202	281	**1107**
Male	36	42	135	51	99	**363**
Primary	208	141	181	139	273	**942**
Secondary	24	31	252	114	107	**528**
First Years	88	55	162	112	144	**561**
Second Years	60	46	221	99	90	**516**
Third Years	30	40	47	32	64	**213**
Fourth Years	54	31	3	10	82	**180**
Totals	**232**	**172**	**433**	**253**	**380**	**1470**

This group included 942 primary preservice teachers, 783 of whom were female (see Table 3.2) and 159 male (see Table 3.3).

Table 3.2. Primary preservice teacher respondents. Females N=783

	University A	University B	University C	University D	University E	**Totals**
First Years	75	44	49	70	78	**316**
Second Years	52	35	87	39	78	**291**
Third Years	24	30	20	8	52	**134**
Fourth Years	27	0	0	2	13	**42**
Totals	**178**	**109**	**156**	**119**	**221**	**783**

Table 3.3. Primary preservice teacher respondents. Males N=159

	University A	University B	University C	University D	University E	**Totals**
First Years	13	11	4	12	22	**62**
Second Years	8	11	16	6	11	**52**
Third Years	6	10	4	0	12	**32**
Fourth Years	3	0	1	2	7	**13**
Totals	**30**	**32**	**25**	**20**	**52**	**159**

There were 528 secondary preservice teachers surveyed, 324 of whom were female (see Table 3.4) and 204 male (see Table 3.5). A more detailed breakdown of all 1470 preservice teachers surveyed is offered in Table 3.6 on the following page.

Table 3.4. Secondary preservice teacher respondents. Females N=324

	University A	University B	University C	University D	University E	**Totals**
First Years	0	0	57	24	22	**103**
Second Years	0	0	74	37	1	**112**
Third Years	0	0	11	16	0	**27**
Fourth Years	18	21	0	6	37	**82**
Totals	**18**	**21**	**142**	**83**	**60**	**324**

Table 3.5. Secondary preservice teacher respondents. Males N=204

	University A	University B	University C	University D	University E	**Totals**
First Years	0	0	52	6	22	**80**
Second Years	0	0	44	17	0	**61**
Third Years	0	0	12	8	0	**20**
Fourth Years	6	10	2	0	25	**43**
Totals	**6**	**10**	**110**	**31**	**47**	**204**

Table 3.6. Detailed summary of all pre service teacher respondents. N=1470

	University A	University B	Univers ty C	University D	University E	**Totals**
Female	196	130	298	202	281	**1107**
Male	36	42	135	51	99	**363**
Primary	208	141	181	139	273	**942**
Secondary	24	31	252	114	107	**528**
First Years	88	55	162	112	144	**561**
Second Years	60	46	221	99	90	**516**
Third Years	30	40	47	32	64	**213**
Fourth Years	54	31	3	10	82	**180**
Fem. Prim.	178	109	156	119	221	**783**
Fem. Sec.	18	21	142	83	60	**324**
Fem. Yr 1	75	44	106	94	100	**419**
Fem. Yr 2	52	35	161	76	79	**403**
Fem. Yr 3	24	30	31	24	52	**161**
Fem. Yr 4	45	21	0	8	50	**124**
Male Prim.	30	32	25	20	52	**159**
Male Sec.	6	10	110	31	47	**204**
Male Yr 1	13	11	56	18	44	**142**
Male Yr 2	8	11	60	23	11	**113**
Male Yr 3	6	10	16	8	12	**52**
Male Yr 4	9	10	3	2	32	**56**
Prim. Yr 1	88	55	53	82	100	**378**
Prim. Yr 2	60	46	103	45	89	**343**
Prim. Yr 3	30	40	24	8	64	**166**
Prim. Yr 4	30	0	1	4	20	**55**
Sec. Yr 1	0	0	109	30	44	**183**
Sec. Yr 2	0	0	118	54	1	**173**
Sec. Yr 3	0	0	23	24	0	**47**
Sec. Yr 4	24	31	2	6	62	**125**
Fem. Yr 1 Prim.	75	44	49	70	78	**316**
Fem. Yr 2 Prim.	52	35	87	39	78	**291**
Fem. Yr 3 Prim.	24	30	20	8	52	**134**
Fem. Yr 4 Prim.	27	0	0	2	13	**42**
Fem. Yr 1 Sec.	0	0	57	24	22	**103**
Fem. Yr 2 Sec.	0	0	74	37	1	**112**
Fem. Yr 3 Sec.	0	0	11	16	0	**27**
Fem. Yr 4 Sec.	18	21	0	6	37	**82**
Male Yr 1 Prim.	13	11	4	12	22	**62**
Male Yr 2 Prim.	8	11	16	6	11	**52**
Male Yr 3 Prim.	6	10	4	0	12	**32**
Male Yr 4 Prim.	3	0	1	2	7	**13**
Male Yr 1 Sec.	0	0	52	6	22	**80**
Male Yr 2 Sec.	0	0	44	17	0	**61**
Male Yr 3 Sec.	0	0	12	8	0	**20**
Male Yr 4 Sec.	6	10	2	0	25	**43**
Totals	**232**	**172**	**433**	**253**	**380**	**1470**

The degree to which the sampling plan was achieved is indicated in Table 3.7. Inspection of this table reveals that, in general, response rates were similar for primary and secondary preservice teachers and across universities with the exception of the lower (29%) return from university D by secondary preservice teachers. The differences in the number of surveys sent out reflect the number of students enrolled in preservice courses at the various institutions. It is to be noted that some of the lower return rates may be a reflection of inaccurate information being provided regarding enrolment figures. It would seem that the actual number of students was at times different to the number listed as enrolled. Nevertheless, return rates of this magnitude (58%) across the whole sample are considered satisfactory for surveys of this kind (Cohen & Manion, 1994).

Table 3.7. Response rates all presence teacher respondents. N=1470

	Surveys Sent Out	Surveys Sent Out	Actual Returns	Actual Returns	Response Rate %	Response Rate %
	Primary	Secondary	Primary	Secondary	Primary	Secondary
University A	340	40	208	24	**61%**	**60%**
University B	240	40	141	31	**59%**	**78%**
University C	280	400	181	252	**65%**	**63%**
University D	240	400	139	114	**58%**	**29%**
University E	380	180	273	107	**72%**	**59%**

Survey procedures

Cooperation

When undertaking any large projec it is necessary to commit adequate time and resources to obtain the support of thos e who will oversee the administration of the surveys, and of the respondents who v ill provide the data. At each of the five universities cooperating in the study the support o a senior academic was obtained. Their role was to advise on the number of students enro led in preservice education courses and to ensure that the questionnaires were administe ed according to the instructions outlined in the supporting documentation.

As surveys are strengthened by high response rates, in terms of the percentage of persons in the designed sample from v hom data are actually obtained, it was necessary to ensure that both the supervisors at the various universities and the respondents understood that the survey was worthwhile. Surveys also depend on the quality of the data, so it was important that the respc ndents cooperated well in answering the survey. In order to minimise disruption to the no mal university program respondents were asked to complete the survey at the end of a lec ure, at which time the aims of the survey were to be explained, instructions given and th e data collection procedures described in detail. The other reason for administering th e surveys in this fashion was to improve response rates which tend to reduce dramatically if respondents take a form away to be filled in at a later date. In order to ensure uniformit y all supervisors were given the same clearly outlined set of procedures for adminis ration .

It was important to ensure that respondents answering the questionnaire about the hypothetical child did not become confused or fatigued. To prevent this, the survey was designed so that each preservice teacher had to respond to only one stimulus character - that is, to one combination of the levels of ability, studiousness and gender - rather than as in the aforementioned studies (Tannenbaum, 1962; Cramond & Martin, 1987; Glover, 1993; Carrington, 1993), where each respondent had to respond to all eight stimulus characters.

Confidentiality

An important aspect of the contact with respondents was the assurance that information provided would be used only for the stated purposes of the survey, with any published reports presenting findings in a manner that would prevent the identification of individual respondents. As this study involved research on human subjects permission was obtained from the University of New England ethics committee. Provisions were undertaken to ensure that confidentiality was provided for all participants as well as informed consent and right of refusal without penalty. Participants were also informed of the broad goals of the study and that feedback would be made available to them regarding research findings.

Coding, editing and verifying

As the data collected in this survey were in the form of the respondents' own written responses on the survey instruments it was necessary to translate this information onto a spreadsheet for it to be systematically analysed. Given the large number of respondents and items it was essential to develop a coding system to allow the data to be organised numerically. To facilitate retrieval for verification and cross-checking each individual survey form was given its own code indicating the university of origin as well as the year level, gender and program of study of the respondent.

Once the coding of responses had been completed editing was carried out in order to identify where anomalies and omissions had occurred. Since it was not possible to return surveys to the respondents for the resolution of anomalies, or for the completion of omitted items, any survey that had anomalies or omissions was not included in the analysis. Commonly, in projects of this nature a sample of the completed instruments is selected for independent verification; however in this study each individual survey was cross-checked and verified, as an error at this stage would be compounded and ultimately would contaminate the analysis.

In association with the entering of the data into the computer, a codebook was prepared which specified the location of each item of the data on the computer files, together with a description of the characteristics of each variable such as the name of the variable, the valid code values and the code values for missing data. Once the initial data file had been established, a further checking procedure was utilised. Checking for wild codes was carried out by the computer to detect cases which had code values outside the valid range. It was then necessary to return to the original responses to find the valid value, after which the file was corrected.

Instrumentation

Any researcher has the choice of using existing instruments or of developing new instruments to measure the concepts included in the conceptual framework. The advantage of using existing instruments is that the work of development and validation has already been undertaken and published. Tannenbaum (1962), Glover (1993) and Carrington (1993) had each used this same instrument in previous studies and each obtained consistently reliable and valid results. On the other hand, there was a concern that the original survey instrument may not adequately operationalize the concepts desired because this present study involved a survey of preservice teachers rather than adolescents. Nevertheless, Cramond and Martin (1987) successfully used this same instrument without any modification with both inservice and preservice teachers.

As the instrument was being used to gain an insight into the attitudes of both primary and secondary preservice teachers trial administrations of the survey were used to establish if any modifications were required. From this process it was decided that respondents wanted the opportunity to declare some traits 'not relevant'. This preference was accommodated and is detailed later in this chapter.

In the present study there were 18 different instruments (see Appendices C, D, E and F), nine concerning secondary preservice teachers and nine concerning primary preservice teachers. Each group of teachers was responding to either a Likert scale questionnaire that was asking them to rate the desirability of one of 54 traits or to one of eight questionnaires involving a series of imaginary stimulus characters. The instruments were administered to preservice teachers during lecture time and respondents needed approximately 10-15 minutes to complete the instrument.

The trait list

The instruments used to assess the desirability of the 54 traits (see Appendices E and F) asked preservice teachers to indicate how desirable it was for a student to have a particular trait. Secondary preservice teachers were asked to consider secondary students and primary preservice teachers were asked to consider primary students. The trait list was the same as that used by Tannenbaum (1962). Tannenbaum's use of a list of traits to establish attitudes was endorsed by McNair (1946, cited in Lindzey & Aronson 1969) who defined an opinion as a belief measured by a single item, whereas an attitude is a belief as measured by an inventory or battery of items. It consisted of a number of descriptive adjectives and phrases, each of which would be judged as descriptive (or not) of every stimulus character. Once the trait list was established Tannenbaum (1962) asked 106 students to rate each of the 54 traits as desirable or undesirable. In his study, for a trait to be classified as either desirable or undesirable, at least 70% of the group had to agree on its nature. When there was less than 70% agreement the trait was listed in the neutral category and therefore not scored or used in the analysis.

This procedure was not followed in the present study with preservice teachers as it did not seem valid to assume that all traits carried an equal degree of desirability, as did the Tannenbaum study. Indeed Tannenbaum (1962) was aware that one of the weaknesses of his study was the lack of information regarding the degree of desirability or undesirability of each trait so that the responses might be weighted accordingly. Tannenbaum (1962) acknowledged a yes response to the trait 'popular' may be a far stronger expression of acceptance than a similar reaction to 'competitive', although both were numbered among the desirable traits and each response was weighted equally in computing the global score. The same is true of undesirable traits, some of which may be more injurious to one's reputation than others.

Likert scales are commonly used to measure attitude. In this study, respondents were provided with a fixed set of response a ternatives for each item: Strongly Undesirable, Moderately Undesirable, Mildly Undesirable, Mildly Desirable, Moderately Desirable, Strongly Desirable and Not Relevant (see Appendices E and F).

People to whom a Likert scale is administered are directed to indicate the extent to which they endorse each statement. Typical response options are strongly agree, agree, neutral or not sure, disagree, and strongly disagree. A numerical value is assigned to each response option. For a favourable statement five points can be assigned to a "strongly agree" response, four points to an "agree" response, and so on. For an unfavourable statement the scoring is reversed (that is, five points are assigned to a "strongly disagree" response). After a numerical value has been assigned to each response made by a particular individual, the numerical values are summed to produce a total score. For this reason, Likert scales are sometimes referred to as summated scales. The major disadvantage with this approach is that different response patterns can produce the same total score. Likert scales therefore are not always as sensitive to assessing attitude change as are Guttman and Thurstone scales.

While the simple characterisation or measurement of individuals is often the main criterion, in this study it was important to control the scoring mechanism. As Tannenbaum (1962) acknowledged , researchers have continued to show concern about the assumption of equal intervals on the rating scales. Data derived from the Likert scale questionnaire are ordinal in nature, that is they do not provide information on the magnitude of the differences between the adjacent points on the scale. Nevertheless, data matrices drawn from the Likert scale instruments are often analysed by summing across rows and down columns and using these marginal totals as dependent variable measures in parametric procedures such as ANCVA. The technique is of doubtful validity (Kerlinger, 1986).

In the present study the reason for using the Likert scale questionnaire was to estimate weightings of desirability for the trait list contained in the Tannenbaum (1962) instrument. This assumes that there is a hierarchy of desirability to uncover. Presumably there will be items that most, if not all, respondents will see as highly desirable or highly undesirable and others that are more controversial. This is analogous to the situation that is familiar to teachers who attempt to evaluate students' performances on academic tests using a fine grained analysis that takes into account individual patterns of response across all questions. For example, there may be a few items in such a test which most students find very difficult and yet some students will pass those items and fail easier ones. Ideally, an analysis of item difficulty, and subject ability, would take into account such patterns of response. If trait desirability is substituted for item difficulty this situation is similar to that found in the Likert scale instrument.

Data of this kind can be analysed using the Australian Council of Education Research's (ACER) QUEST software which is an implementation of the Rasch latent trait scaling model (Masters, 1982). The partial credit form of the Rasch model provides estimates of item difficulty and respondent ability for polychotomously scored items. Importantly, these estimates of item difficulty and respondent ability are expressed on a logit scale and hence, at an interval/ratio level of measure. For that reason, the item difficulty estimates can be used as weights in subsequent analyses.

The Rasch Rating Model

The Rasch model is a more recent formulation of a mathematical model for ratings that accommodates not only the features of a random response process and the estimation of thresholds but also the simple integer scoring of the successive response categories and the simple summing among tasks or statements. By using the Rasch model it is possible to analyse polychotomously scored survey results more precisely as the simple total score is not seen as the sum of equally spaced thresholds, but rather as a count of the number of thresholds which have been "passed". Such a design allows actual weighting of the thresholds, obtained as estimates, to be taken account of separately.

As Wright and Masters (1982) cautioned, before estimates are used as calibrations and measurements, it is necessary to verify that the data from which they came are suitable for measuring. The requirements for measuring are specified by the model. If the data cannot be managed by the model, then they cannot be used to calibrate items or measure persons. To evaluate the fit between data and model, the validity of item response patterns must be examined during item calibration, and the validity of person response patterns examined during measurement.

Algebraically, in the Rasch model for polychotomously scored data - usually referred to as the partial credit model - the probability of respondent n responding in the category x of item i is given by

$$P_{nix} = \left\{ \frac{\exp \sum_{j=1}^{x} \left(\beta_n - \delta_i - \tau_j \right)}{1 + \sum_{i=1}^{m} \exp \sum_{j=1}^{x} \left(\beta_n - \delta_i - \tau_j \right)} \right\}$$

where β_n is the ability of respondent n; δ_i is the overall item difficulty; $\tau_1, \tau_2, \ldots, \tau_M$ is a set of parameters associated with the transition between response categories; and m is the number of response categories provided for each item.

As previously suggested, in the present study, item difficulty was construed as the desirability of each trait in the list, and respondent ability as the subject's perception of desirability across all items. Hence trait desirability and respondent's ability to discriminate, are closely related as two sides of a perceptual interaction. In the Rasch model this is reflected in the locating of both trait desirability and respondent's ability to discriminate on the same logit scale.

It is important to remark that the Rasch model assumes unidimensionality of the construct being measured. If this assumption is not warranted, as demonstrated by Duncan and Stenbeck (1987) using political opinion data, the resultant estimates are difficult to interpret. Unidimensionality issues associated with Likert scale data have provoked considerable debate since Thurstone (1959) formulated his attitude scale and Guttman (1950, 1955) provided his measures of scalability. However, as Andrich (1988) pointed out, unidimensionality is a relative matter - every human performance, action or belief is complex and involves a multitude of component abilities, interest and so on. Nevertheless there are circumstances when it is considered useful to think of a set of concepts in unidimensional terms.

The Rasch model also offers empirical evidence bearing on the issue of unidimensionality in the form of an item consistency index. The index measures the extent to which items are homogeneous, that is, in the present context that they refer to traits that can be perceived along a dimension of desirability. The internal consistency index reported by the QUEST software for polychotomously scored data is analogous to Cronbach's alpha, and as Anastasi (1976) suggests it is usual to set 0.7 as a minimum acceptable level.

Another possible systematic source of inconsistency occurs when different individuals use response categories differently. For example, some respondents may use the extreme categories (strongly desirable or undesirable), while others may use the central categories (mildly desirable or undesirable), relatively too often. Both types of response pattern, reflecting biased response sets, can threaten the validity of measurement. The Rasch model allows the analyst to determine whether response sets affect the survey results in an adverse way.

In constructing rating response formats so as to minimise the above problems, two further issues were taken into account. Firstly, the number of categories used was six so as to be large enough to take advantage of the respondent's capacity to discriminate. Secondly, in bipolar scales, the neutral or undecided category has been the subject of much study. It seems not to attract responses consistent with those found on either side of it. As a category it seems to attract people who do not understand the question, as well as people who are genuinely undecided, or neutral. With this in mind the survey utilised an even number of ratings, and thus respondents were forced to decide firstly if the trait was desirable or undesirable and secondly to then make a judgement about its degree of desirability. The category of 'not relevant' was utilised but was placed at the side rather than in the middle so that it could not be confused as being a neutral or undecided response (see Appendices E and F).

Additionally, the QUEST software reports a range of item fit statistics which allow the analyst to identify items which do not fit the measurement model. In particular, the software reports an item separation index, which is a measure of the distribution of item difficulty over the range of the variable. Given that in the present study the intention was to use the item difficulty estimates as weights it would be hoped that the estimates would not be clustered tightly around a mean value and that there would be a reasonable separation between adjacent items in terms of their difficulty levels. For that reason, the item separation and item consistency statistics measure aspects of validity and were inspected closely before deciding to use the item difficulty levels in weights in subsequent analyses.

One of the obvious advantages of using the Rasch model is that the measures, rather than simple ratings, are available, and the process of attempting to obtain formal measurements yields a greater understanding of the traits being investigated. A close examination of response patterns which do not conform to the model may be as informative in understanding the variable as when they do conform, and the Rasch model permits a refined analysis which detects lack of conformity in various ways.

Trait desirability scale

In order to construct the trait desirability scale the trait list was presented to 164 preservice teachers (108 primary and 56 secondary) who were asked to rate each trait's desirability on a six point Likert scale. Respondents were given the opportunity to rate traits as either strongly undesirable, moderately undesirable, mildly undesirable, strongly desirable, moderately desirable, mildly desirable or they could indicate that a trait was not relevant to their particular group of students. This last choice was included in response to findings with trial administrations. This innovation was deemed necessary as the original trait list was designed for use with adolescents and it was obvious some of the traits might not be relevant to primary aged children.

Tannenbaum (1962) had used a cut-off point of 70% to decide on an individual trait's relevance. This study adopted a cut-off point of 75% as it was clear that there was a well defined distinction between the 47 traits considered relevant and the seven deemed to be not relevant. Those traits not achieving a score of 75% or higher in terms of relevance (thus more than 25% or more of respondents deemed them not relevant) were dropped from the scoring procedures and from any further part in this part of the statistical analysis. The traits identified as not relevant are interesting in their own right.

On the basis of the ratings given on the six point scale by the preservice teachers it was possible to classify traits in broad terms as either desirable or undesirable. In order to further refine the process each trait was given a weighting of desirability. Separate desirability weightings were generated for both primary preservice teachers and secondary preservice teachers. The findings of the Rasch analysis of desirability and relevance of traits is given in chapter four, and the use of the trait weights in scoring subjects' responses to the social perception questionnaire are described later in this chapter.

The questionnaire

As previously explained both primary (see Appendix C) and secondary preservice teachers (see Appendix D) were presented with one of a possible eight questionnaires asking them to respond to a particular imaginary stimulus character. Each character was described in two sentences and the descriptions were composed of statements rather than listings of characteristics, to reduce perceptual ambiguity of the respondents. The first sentence referred to academic ability (gifted or average), while the second referred to gender (female or male) and to application to study (spends more time studying or spends no more time studying). The three dichotomised personal qualities were then arranged to appear in every possible combination, thus creating eight stimulus characters. In order to make the task easier the two groups of preservice teachers were presented with stimulus characters that varied but only in that they were labelled primary (see over) or secondary (see over). Subjects were asked to respond to a particular hypothetical student by reading the two-sentence description and then marking 'yes' or 'no' to indicate whether the student could be classified by any of the list of 54 descriptive phrases. In keeping with ethical guidelines students could choose not to participate without penalty of any kind.

The eight stimulus characters presented to high school preservice teachers were as follows:

1. Pupil A is a *gifted* high school student who is always among the highest in class in all academic subjects. *She* spends *more* time at home studying school subjects and doing homework than do most students.

2. Pupil B is an *average* high school student who receives fair grades in all academic subjects. *He* spends *no more* time at home studying school subjects and doing homework than do most students.

3. Pupil C is a *gifted* high school student who is always among the highest in class in all academic subjects. *She* spends *no more* time at home studying school subjects and doing homework than do most students.

4. Pupil D is a *gifted* high school student who is always among the highest in class in all academic subjects. *He* spends *more* time at home studying school subjects and dong homework than do most students.

5. Pupil E is an *average* high school student who receives fair grades in all academic subjects. *She* spends *no more* time at home studying school subjects and doing homework than do most students.

6. Pupil F is a *gifted* high school student who is always among the highest in class all academic subjects. *He* spends *no more* time at home studying school subjects and doing homework than do most students.

7. Pupil G is an *average* high school student who receives fair grades in all academic subjects. *She* spends *more* time at home studying school subjects and doing homework than do most students.

8. Pupil H is an *average* high school student who receives fair grades in all academic subjects. *He* spends *more* time at home studying school subjects and doing homework than do most students.

The eight stimulus characters presented to primary school preservice teachers were as follows:

1. Pupil A is a *gifted* primary school student who is always among the highest in class in all academic subjects. *She* spends *more* time at home studying school subjects and doing homework than do most students.

2. Pupil B is an *average* primary school student who receives fair grades in all academic subjects. *He* spends *no more* time at home studying school subjects and doing homework than do most students

3. Pupil C is a *gifted* primary school student who is always among the highest in class in all academic subjects. *She* spends *no more* time at home studying school subjects and doing homework than do most students.

4. Pupil D is a *gifted* primary school student who is always among the highest in class in all academic subjects. *He* spends *more* time at home studying school subjects and doing homework than do most students.

5. Pupil E is an *average* primary school student who receives fair grades in all academic subjects. *She* spends *no more* time at home studying school subjects and doing homework than do most students.

6. Pupil F is a *gifted* primary school student who is always among the highest in class all academic subjects. *He* spends *no more* time at home studying school subjects and doing homework than do most students.

7. Pupil G is an *average* primary school student who receives fair grades in all academic subjects. *She* spends *more* time at home studying school subjects and doing homework than do most students.

8. Pupil H is an *average* primary school student who receives fair grades in all academic subjects. *He* spends *more* time at home studying school subjects and doing homework than do most students.

Construct validity

An important issue to address was the construct validity of the instrument, that is whether the questionnaire was actually measuring what it was intended for. In order to ascertain what preservice teachers were thinking about when they completed the questionnaire a series of interviews was carried out. Twenty-four preservice teachers from the original sample were chosen at random and asked a series of questions about their thoughts when filling in the surveys. Three preservice teachers, two primary and one secondary, were each exposed to each of the surveys describing the eight different stimulus characters and asked to respond freely to the following questions:

(1) After reading the first two pages of the survey what do you understand you are being asked to do?

(2) After reading the description of the student at the top of the page what were you thinking?

(3) Were you thinking of a child you have met or know, a child you have taught, a child you may teach in the future or perhaps a child in another situation?

The responses to the first question indicated that all the preservice teachers understood the instructions clearly and were in no way unclear about what they were being asked to do. After reading the description of the stimulus character at the top of the second page most preservice teachers began to think about and visualise a student. Depending on the characteristics outlined in the description the preservice teachers began to describe the student in their own words in response to question two. The following list of statements is typical of how the preservice teachers responded.

The following comments were typical of how primary and secondary preservice teachers responded after reading the following description of pupil 'D':
Pupil D is a *gifted* primary school student who is always among the highest in class in all academic subjects. *He* spends *more* time at home studying school subjects and doing homework than do most students.
"...It's not unusual to have a student like this ... I've had one like this on prac ... you've got 'he' written so obviously it's a boy...."
"...Conscientious at school ... enthusiastic about doing well ... pressure to succeed, maybe from home ... could stress out ...."

The following comments were typical of how primary and secondary preservice teachers responded after reading the following description of pupil 'F':
Pupil F is a *gifted* primary school student who is always among the highest in class all academic subjects. *He* spends *no more* time at home studying school subjects and doing homework than do most students.
"...A regular child in the classroom who performs at a higher level ... I'm just thinking what this says ...it doesn't give me in an image in my head if that's what you're looking for but I know a kid like this ...."

The following comments were typical of how primary and secondary preservice teachers responded after reading the following description of pupil 'C':
Pupil C is a *gifted* high school student who is always among the highest in class in all academic subjects. *She* spends *no more* time at home studying school subjects and doing homework than do most students.
"... An exceptional student ... bright student in all school areas ... don't know about sport though ...."

In question three students were asked if after reading the description of the stimulus character they were thinking of a child they had met or knew, a child they had taught or may teach in the future or perhaps a child in another situation. The following is a representative sample of their responses:

"... A primary student in class ... a hypothetical not a particular one. A case study kind of thing from a teacher's point of view ... "

" ... Not thinking of anyone in particular ... made up a kid, didn't get a picture of him or give him a name ... just a kid you'd see in school ...."

" ... " I'm thinking as if I was a teacher ... I'm imagining that child in the context of my classroom. I think of myself as a teacher and them (sic) as a student and I think of the child in the context of the classroom...because it compares him to other students ...."

" ... A previous student I taught ... Nicole Smith. I got a picture of her straight away .... "

" ... As a teacher I can relate to this. It's not that rare and you see these kids all the time ...."

The responses offered by the preservice teachers to Question 3 demonstrate clearly that they were placing themselves in the position of classroom teacher or future classroom teacher and thus their responses can be interpreted as an indication of the attitudes they hold towards the various types of stimulus characters they were presented with. An understanding of the context they placed themselves in when answering the questionnaire is important when interpreting the results and drawing conclusions.

Factor analysis

Internal construct validity was further examined by carrying out Principal Component Analyses of the primary and secondary Likert scale trait responses. The principal component form of factor analysis was used in preference to the common factor model because the analysis was exploratory in nature and unguided by either theoretical argument or empirical evidence (Tabachnick & Fidell, 1989).

Both the primary and secondary data sets were found to be factorable. For the primary data, Bartlett's chi square was 3055.64 (df =1127, p<.0001); for the secondary, 2990.65 (df=1127, p<.0001). Using an eigenvalue greater than 1 criterion (Hair et al., 1987), an orthotran/varimax transformation and oblique rotation, 13 factors were extracted for the primary data, and 14 for the secondary. For both data sets, fewer than 10% of the factor intercorrelations exceeded .30, indicating factor structures that had potential for meaningful interpretation.

Table 3.8 below shows the eigenvalues and the proportion of variance accounted for by each of the 13 factors extracted for the primary data.

TABLE 3.8 Primary factors- eigenvalues and the proportion of variance

Factors	Eigenvalues	Variance Proportion	Factors	Eigenvalues	Variance Proportion
Factor 1	9.762	.208	Factor 9	1.407	.03
Factor 2	4.573	.097	Factor 10	1.344	.029
Factor 3	2.656	.057	Factor 11	1.227	.026
Factor 4	2.375	.051	Factor 12	1.103	.023
Factor 5	2.06	.044	Factor 13	1.046	.022
Factor 6	1.984	.042	Factor 14	.983	.021
Factor 7	1.685	.036	Factor 15	.95	.02
Factor 8	1.465	.031			

Table 3.9 below shows the factor loadings of the 47 traits on the 13 factors extracted for the primary data from the oblique solution primary pattern matrix.

TABLE 3.9 Primary factor loadings

Factor 1		**Factor 7**	
Good conversationalist	.505	Healthy	.708
A good leader	.41	Bright	.526
Competitive	.73	Has an answer to every question	.518
Sociable	.831	Has a well rounded life	.534
Has good ideas	.338	Likes school	.565
Takes criticism well	.658	In many extra curricular activities	.603
Expresses themselves well	.721		
Can take responsibility well	.741	**Factor 8**	
		Has good manners	.595
Factor 2		Has a pleasing personality	.796
Spoiled	.694		
Dull	.709	**Factor 9**	
Shy	.428	Creep	.705
Stuck-up	.732	Studious	-.444
Brags about their marks	.418		
		Factor 10	
Factor 3		Believes in all school and no play	.596
A good school citizen	.334	Doesn't have much fun	.719
Cheerful	.555		
Kind	.578	**Factor 11**	
Obedient	.842	Perfectionist	.827
Conscientious	.873		
		Factor 12	
Factor 4		Brain	.448
A good Sport	.752	Walking dictionary	.437
Bookworm	.832	Proud of their work	.621
Serious	.445	Quiet	-.445
Factor 5		**Factor 13**	
Complain of not knowing enough	.634	Nervous	-.566
Dislikes kids who get high marks	.508	Has good study habits	.569
Talks about you behind your back	.84	Has an open mind to all situations	.661
Sticks with their own crowd	.351		
Factor 6			
Teachers pet	.531		
Mature	.753		

A detailed examination of the loadings on the factors given in Table 3.9 failed to reveal a coherent pattern; that is, common threads of meaning connecting traits within factors were not found.

Table 3.10 below shows the eigenvalues and the proportion of variance accounted for by each of the 14 factors extracted for the secondary data.

Table 3.10 Secondary factors- eigenvalues and the proportion of variance

Factors	Eigenvalues	Variance Proportion	Factors	Eigenvalues	Variance Proportion
Factor 1	10.849	.231	Factor 9	1.496	.032
Factor 2	5.158	.11	Factor 10	1.443	.031
Factor 3	3.133	.067	Factor 11	1.211	.026
Factor 4	2.968	.063	Factor 12	1.16	.025
Factor 5	2.498	.053	Factor 13	1.122	.024
Factor 6	2.208	.047	Factor 14	1.036	.022
Factor 7	1.864	.04	Factor 15	.926	.02
Factor 8	1.702	.036			

Table 3.11 below shows the loadings of the 47 traits on the 14 factors extracted for the secondary data from the oblique solution primary pattern matrix.

Table 3.11 Secondary factor loadings

Factor 1		**Factor 6**	
Good conversationalist	.707	A good sport	.752
Sociable	.857	Creep	-.75
Healthy	.749	Believes in all school and no play	.456
Factor 2		**Factor 7**	
A perfectionist	.696	Well rounded life	.799
Perfectionist	.737		
Stuck-up	.735	**Factor 8**	
Has good manners	.669	Dislikes kids who get high marks	-.847
Has an answer to every question	.669	Expresses themselves well	.718
Factor 3	.	**Factor 9**	
Good leader	.8	Complain of not knowing enough	.731
Serious	.537		
Competitive	.747	**Factor 10**	
Proud of their work	.732	Teachers pet	.745
Mature	.546	Brags about marks	.742
Cheerful	.746		
Kind	.422	**Factor 11**	
Bright	.528	Walking dictionary	.513
Has a pleasing personality	.531	Nervous	.539
		Shy	.817
Factor 4		Quiet	.54
Obedient	.526		
Has an open mind to all situations	.7	**Factor 12**	
Has good ideas	-.484	Talks about you behind your back	.756
Takes criticism well	.629		
In many extra curricular activities	.81	**Factor 13**	
Doesn't have much fun	.515	Spoiled	.718
		Dull	.477
Factor 5		Can take responsibility well	.536
Good school citizen	.621		
Bookworm	.848	**Factor 14**	
Conscientious	.61	Brain	.796
Studious	.556	Likes school	.541
Has good study habits	.639		

As was the case for the primary data, a detailed inspection of the loadings in Table 3.11 did not expose consistent, semantic themes linking traits within factors. Additionally, a comparison of Tables 3.9 and 3.11 shows that, even allowing for some movement of traits between factors, there was not a similar trait - factor structure between the primary and secondary data.

It is known that ordinal variables, as well as highly correlated factors, confuse the factor analysis procedure (Schumacker & Linacre, 1996; Goekoop & Zwinderman, 1994). Moreover the greater the number of degrees of difficulty among the items in a test or among a test in a battery, the higher the rank of the matrix of inter-correlations; that is differences in difficulty are represented in the factorial configuration as additional factors (Ferguson, 1941, p.323).

For these reasons, some analysts (Bond, 1994) now recommend that if factor analysis produces factors that are difficult to interpret they should be confirmed by Rasch analysis. That is, Rasch analysis should reveal the factor structure either by exposing multi-dimensionality in the data, or by yielding a number of item difficulty levels approximately equal to the number of factors. In the present case, as will be reported in the next chapter, the Rasch analyses suggest unidimensionality in the primary and secondary data; that is, the traits could be scaled in order of difficulty on one dimension.

The Rasch analysis also provided no support in terms of item difficulty levels for the factor structures produced by the principal component analyses. For example, it could be expected that traits that were seen as almost the same in terms of desirability such as "Has an open mind to all situations" and "Has good manners" (see Tables 4.2), would be located in the same or similar groups of traits when the factors are analysed (see Tables 3.9). Likewise, traits such as "Good sport" and "Believes in all school and no play" (see Tables 4.3), which had the largest difference in terms of desirability, would not be located in the same factors (see Tables 3.11). This was not the case and there was no clear consistent grouping of traits into factors within and across the primary and the secondary data.

Finally, so as to further explore the factor structure, second order factor analyses were carried out on the primary and secondary factors extracted by the principal component analyses. However, these yielded only minor additional reductions in the numbers of factors and failed to provide any further support for the existence of underlying factors that had semantic consistency.

Given this evidence, it was concluded that the 47 traits were important in themselves rather than as proxy variables for broader factors, implying that when preservice teachers read the trait lists they were attending to the individual traits rather than to underlying factors, thereby increasing the validity of this instrument as a device for estimating trait weights.

Scoring procedures

As previously explained, the Rasch model provided estimates of trait desirability on a logit scale. These estimates were used as weights in the scoring algorithm applied to the responses on the social perception questionnaire. With the trait desirability weights now obtained, and using a mean of zero, it was possible to classify the 47 relevant traits as either "desirable" or "undesirable". There were four possible outcomes that might arise when preservice teacher respondents were deciding if a particular trait was descriptive of the stimulus character they were presented with. They could respond yes to a desirable trait, no to a desirable trait, yes to an undesirable trait or no to an undesirable trait. As the goal of the scoring algorithm was to ascertain the desirability of each of the stimulus characters it was necessary to decide which response patterns would indicate an increase in the desirability of the stimulus character. In order to achieve this without causing an unnecessary doubling and, thus, a distorting of values, only those response patterns that would bring about an increase in desirability were scored. The logic of the scoring procedure is best explained through an example.

It is reasonable to assume that if a stimulus character was being described as cheerful this would enhance that stimulus character's level of desirability by the appropriate weighting given to it (given that the trait cheerful was found to be a desirable trait). On the other hand it may be unwise to assume that if a stimulus character was not described as cheerful that this would detract to the same extent from that stimulus character's level of desirability. The same case would exist if the stimulus character was seen not to be dull (given that dull was weighted as an undesirable trait). While it is logical to assume that if a stimulus character is seen not to have an undesirable trait then it is possible to quantify the degree to which this would enhance that character's desirability level by using the absolute value of the weighting assigned, the reverse is not. That is, if the stimulus character was seen as being dull then no quantifiable increase has occurred in terms of that stimulus character's level of desirability.

This scoring algorithm is important in terms of obtaining the mean global scores and an analogy can be drawn between the concepts of 'reinforcement' and 'desirability'. In a psychological sense the term reinforcement is applied to any action that is likely to result in an increase in the target behaviour. This increase in the target behaviour can be achieved in two ways, through the use of positive reinforcement or negative reinforcement. Positive reinforcement is the addition of a pleasant consequence while negative reinforcement involves the removal of an aversive stimulus. Both forms of reinforcement result in the same outcome, an increase in the target behaviour. The same principle has been applied in this case in that the existence of a desirable trait or the absence of a undesirable trait will both result in an increase in the desirability of the stimulus character. In order to further clarify the above explanation, a hypothetical representation is offered below.

The primary preservice teacher weightings of desirability will be used. The trait 'cheerful' was found to be a desirable trait with an absolute weighting of 0.87 and the trait 'dull' was found to be undesirable with an absolute weighting of 0.55 (remembering that the scale had a mean of zero). Using just these two traits and applying them to a stimulus character it would be possible for a respondent to describe a stimulus character in four ways. These would be:

(a) cheerful and not dull

(b) cheerful and dull

(c) not cheerful and not dull

(d) not cheerful and dull

Given the weightings assigned it would appear to indicate that if a stimulus character was described as being cheerful and not being dull this would ensure the highest possible weighting of desirability. Obviously if a stimulus character was described as not being cheerful and being dull then this would ensure the lowest level of desirability. A stimulus character described as being cheerful and being dull would be seen as more desirable when compared to a stimulus character described as not being cheerful and not being dull (given that the cheerful trait has a higher absolute weighting value). Thus by looking at the four possible outcomes they appear in order of desirability in the following way (the appropriate weighting is also given):

(a) cheerful and not dull	1.42
(b) cheerful and dull	0.87
(c) not cheerful and not dull	0.55
(d) not cheerful and dull	0

As explained, questionnaires were scored by assigning the absolute value of the appropriate trait desirability weighting for every 'yes' indicated for a desirable description and every 'no' indicated for an undesirable description. Responses that indicated the reverse situation ('no' for a desirable and 'yes' for an undesirable) were not assigned a weighting as this would have involved an unnecessary and distorting doubling of the values. Responses to the not relevant traits and omissions were not scored.

An example of how an individual g obal score (in this case a female secondary preservice teacher from university C) was obtained is outlined in Table 3.12 on the following page. The respondent had been presented with the following description of a hypothetical student:

Pupil B is an *average* high school student who receives fair grades in all academic subjects. *He* spends *no more* time at home studying school subjects and doing homework than do most students.

By looking at column one it is clear the respondent answered "yes" to trait number one, indicating that she felt the hypothetical student was likely to be a "good sport". Trait number one was found to be a generally desirable trait and had been given a desirability weighting of -0.44 (negative values indicate a desirable trait). As the respondent had answered "yes" to a desirable trait the absolute value was assigned in column four. By looking at column one it is clear the respondent answered "no" to trait number two, indicating that she felt the hypothetical student was not likely to be a "perfectionist". Trait number two was found to be a general y undesirable trait and had been given a desirability weighting of 0.31 (positive values indicate a undesirable trait). As the respondent had answered "no" to a undesirable trait the absolute value was assigned in column four. When we examine column one again, but this time examine the response to trait number four, a different scoring procedure is applied. The respondent answered "no" to trait number four, indicating that she felt the hypothetical student was not likely to be a "brain". Trait number four was found to be a generally desirable trait and had been given a desirability weighting of -0.29. As the respondent had answered "no" to a desirable trait no weighting was assigned in column four. A reverse situation arose with trait number 37. In this case the respondent felt that the hypothetical student was likely to "have an answer to every question ". As this was not seen as a generally desirable trait, no weighting was assigned in column four.

Table 3.12. Example of how scoring was carried out to obtain a global score.

Column One Responses female Preservice. Sec/T University C 1=Yes 2=No	Column Two Traits classified 1= Desirable 2= Undesirable	Column Three Trait weightings	Column Four Individual Trait Scores once Weightings were assigned	Column Five Original number of trait with those not relevant removed
1	1	-0.44	0.44	1
2	2	0.31	0.31	2
2	2	0.38	0.38	3
2	1	-0.29	0	4
1	1	-0.17	0.17	5
1	1	-0.47	0.47	6
2	2	0.14	0.14	7
2	2	0.65	0.65	8
1	1	-0.5	0.5	9
1	1	-0.62	0.62	10
2	2	0.61	0.61	11
2	2	0.13	0.13	12
2	2	0.51	0.51	13
2	1	-0.07	0	14
1	1	-0.58	0.58	15
1	1	-0.22	0.22	16
2	2	0.66	0.66	17
1	1	-0.37	0.37	18
1	1	-0.38	0.38	19
2	2	0.43	0.43	20
1	1	-0.28	0.28	21
2	1	-0.13	0	23
2	2	0.82	0.82	25
1	1	-0.37	0.37	26
2	2	0.22	0.22	27
1	2	0.31	0	29
1	1	-0.33	0.33	30
1	2	0.05	0	31
1	1	-0.11	0.11	32
1	1	-0.11	0.11	33
2	1	-0.55	0	34
1	1	-0.44	0.44	35
1	1	-0.35	0.35	36
1	2	0.42	0	37
1	1	-0.31	0.31	38
1	2	0.04	0	39
2	2	0.43	0.43	40
2	2	0.62	0.62	41
2	2	0.51	0.51	42
1	1	-0.2	0.2	43
2	2	0.82	0.82	44
2	2	0.02	0.02	45
1	1	-0.76	0.76	48
1	1	-0.24	0.24	49
1	1	-0.85	0.85	50
1	2	0.27	0	51
2	2	0.77	0.77	53
	Individual Global Score =		**16.13**	

Thus, a global attitude score was assigned to each hypothetical student by each respondent, with the highest score representing the most positive overall attitude. These individual respondents' scores were then totalled and a mean global score established for both primary preservice teachers (see Table 3.13) and secondary preservice teachers (see Table 3.14).

Table 3.13. Mean global scores: primary preservice teachers (N=776)

Average Nonstudious Male	Average Nonstudious Female	Average Studious Female	Gifted Nonstudious Female	Average Studious Male	Gifted Nonstudious Male	Gifted Studious Male	Gifted Studious Female
19.93	19.73	18.64	18.51	17.9	17.64	16.49	16.42

Table 3.14. Mean global scores: secondary preservice teachers (N=450)

Gifted Nonstudious Female	Average Nonstudious Male	Gifted Nonstudious Male	Average Nonstudious Female	Average Studious Female	Gifted Studious Male	Average Studious Male	Gifted Studious Female
14.52	13.96	13.77	13.22	12.79	12.24	12.18	11.9

As Tannenbaum (1962) acknowledged, the forced choice imposed some difficulty on the respondents and the readers of an imaginary character tend to ascribe to him/her traits that are not contained in the description. The respondents in the present study were offered a larger selection of traits, thus providing less need to ascribe traits not contained in the character description. In spite of this concern Tannenbaum (1962) was able to demonstrate that although some respondents may object to being required to form stereotypes, they were able to do so effectively. Badt (1957) and Smidchens and Sellin (1976) both studied university students' attitudes towards gifted students and found that when university students were asked to respond "yes" or "no" there was a greater number of "no" responses due to the respondents' disposition to respond negatively to labels. It would appear that a small number of preservice teachers expressed some concerns with regard to being forced into making choices that appeared to be labelling students. There was no conclusive evidence that respondents did as Badt (1957) and Smidchens and Sellin (1976) found.