

## Chapter 5 Analysis of data

### 5.1 Results of data gathering

Gathering data from any natural setting is made difficult by the potential intrusion of the Hawthorne Effect. Therefore, any analysis of data needs to recognise that the presence of an observer in any natural setting will have an impact on the subjects' behaviour. Le Compte and Goetz (1982) explain the Hawthorne Effect as a simple fact that results from the researcher asking questions about the ways in which things have developed. They suggest that this alone can cause respondents to think more carefully than they otherwise would, and that this in turn will reflect itself in their subsequent behaviour. The results of the Hawthorne Effect may evidence themselves in a consciously planned show in which participants seek to reveal themselves in the best possible light (Le Compte & Goetz, 1982:46); or it may result in an unconscious distortion to provide what participants believe the researcher wants to see or hear (Le Compte & Goetz, 1982:46). Consequently, the researcher applied methodological triangulation, in an attempt to minimise the impact of the Hawthorne Effect. The researcher believed that this form of data gathering had the most to offer in the context in which this research project took place (Cohen & Manion, 1994:236).

#### (i) Quantitative

##### Questionnaire

The Gagné and Nadeau questionnaire "Opinions about the gifted and their education" (1991) was administered as a pre-test and as a post-test to both the teaching staff of the Experimental School and the teaching staff of the Control School during the first and last weeks of the 1997 academic year.

The response rate for both schools was very pleasing. Pre-test and post-test returns from the Experimental School were 82% (41 out of 50) and 86% (43

out of 50) respectively, while returns from the Control School for the pre-test and the post-test were 93% (28 out of 30) and 67%(20 out of 30) respectively.

Statistical procedures provide a means of handling numerical information and of making sense of it. Descriptive statistics were used first to organise, summarise and describe the data. Inferential statistics were used to determine judgements and arrive at conclusions based on the sets of data.

Two frequently used ways of organising descriptive research data are (1) arranging the measures into frequency distributions and (2) presenting them in graphic form. Frequency distributions represent a “systematic arrangement of individual measures from lowest to highest” (Ary, Chester Jacobs & Razavich, 1996:130). These results can then be graphically depicted, allowing several important characteristics of the distribution to be ascertained:

- (a) The general shape of the distribution
- (b) Whether the distribution was symmetrical or skewed
- (c) Where clusters of scores tend to be and how many clusters there were
- (d) The general range of scores and whether there were any unusually low or high scores.

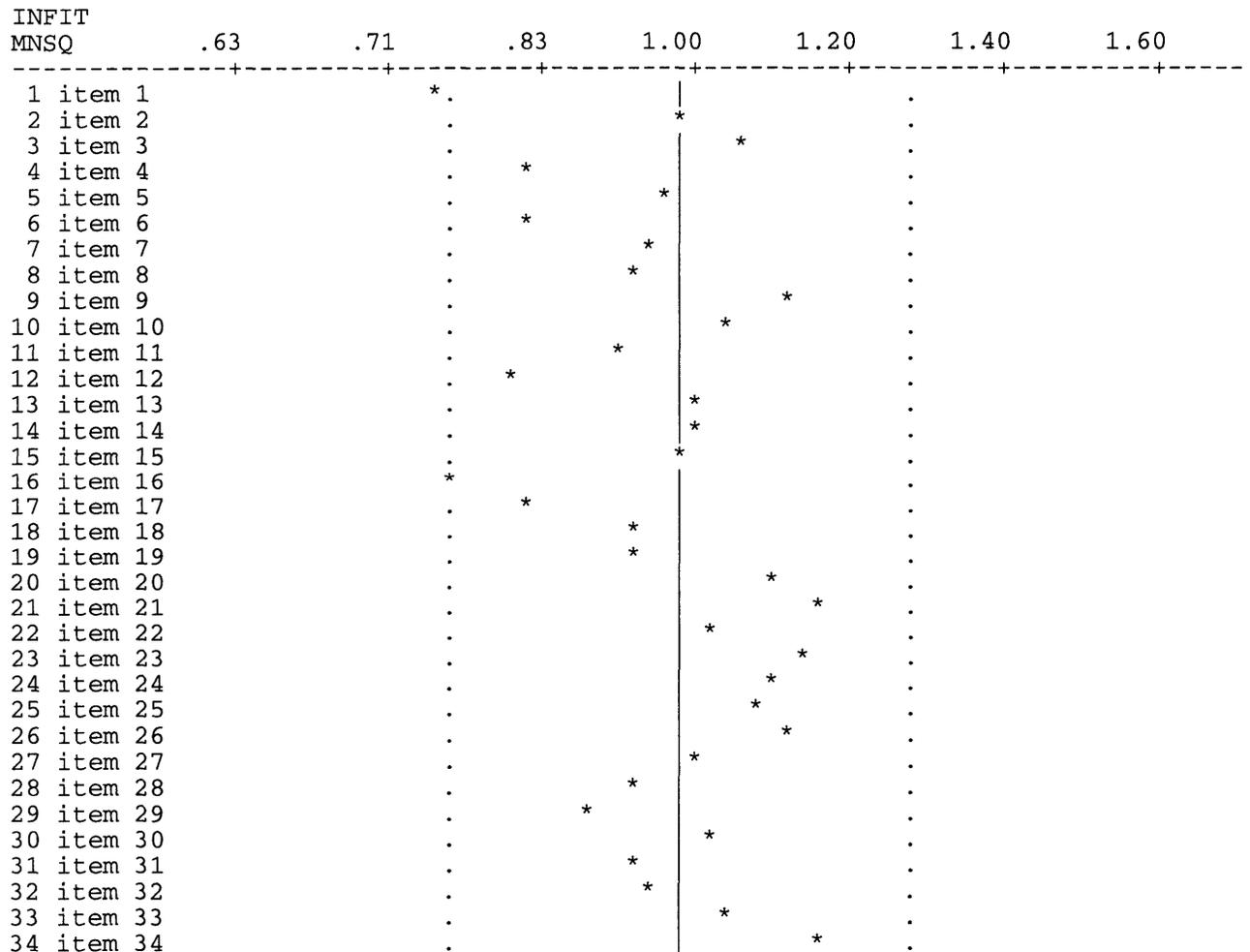
The researcher chose to depict graphically this distribution data using a frequency polygon so that the relationship between the data could be visually displayed and comparisons could easily be made (see section 5.2 - Discussion of Results).

The next step involved building Rasch models for the pre-and post-test files for the Experimental and Control schools separately for each scale (ie A to F). This study was fundamentally interested in deriving measures of subject personability by using Rasch analysis. The researcher found that it was not

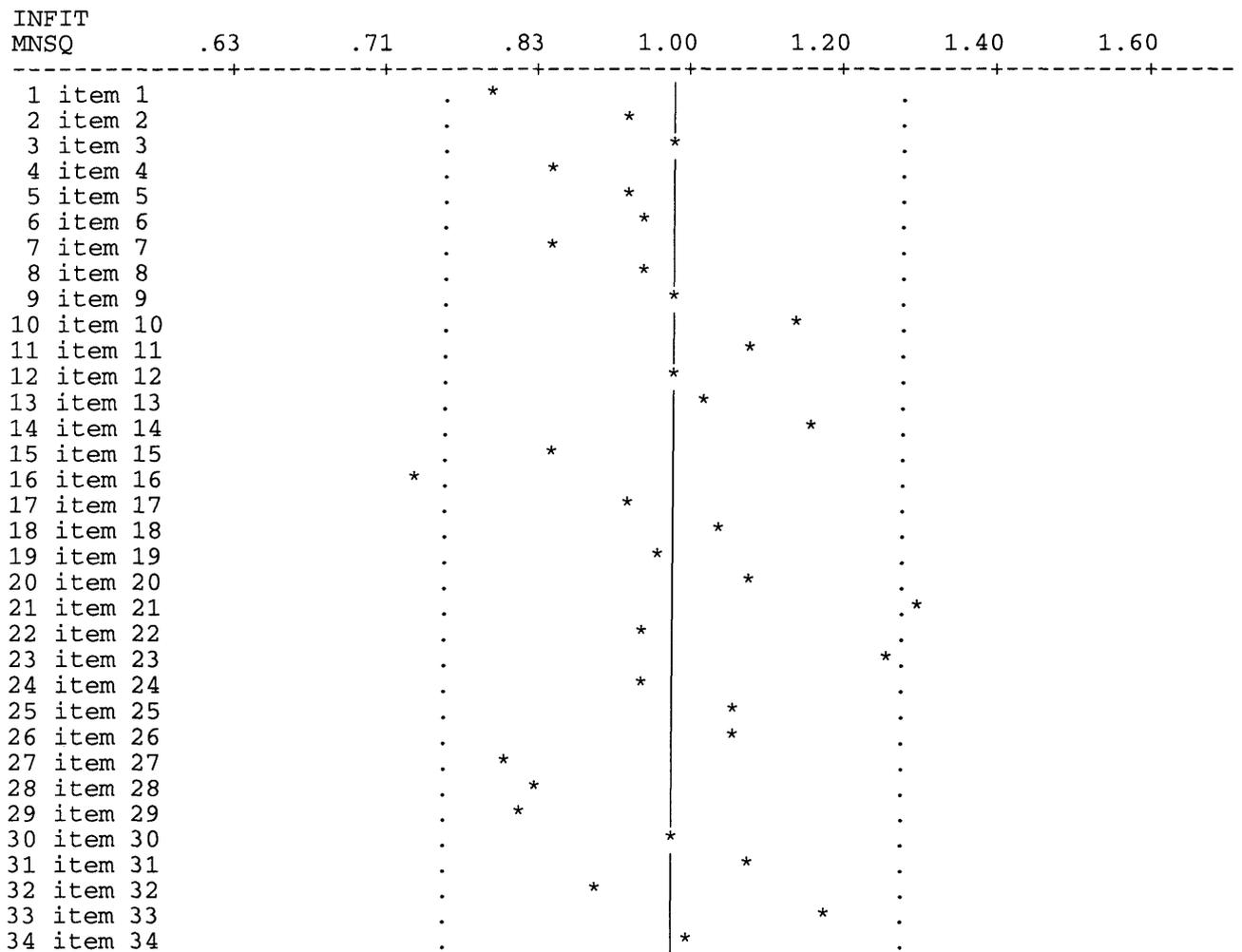
possible to derive reliable interval level measures for each subject on each factor on either pre-test or post-test scores. Consequently, it was decided to model responses to all 34 questions, treating them as one scale on both pre-and post-test.

This led to a model that had acceptable fit parameters. Specifically, the case Infit mean square (MnSq) value was pre-test 1.01 and post-test 1.03; the case reliability parameter was pre-test 0.80 and post-test 0.89; and the item consistency parameter was pre-test 0.80 and post-test 0.84. Moreover, the item Infit MnSq map for pre-test and post-test (see Figures 3 and 4) indicated that all but one of the items of the pre-test and all but two of the post-test fell within the bounds recommended by Wright and Linacre (1994 in Chern, Kielhofner, de las Heras & Magalhaes, 1996:518).

**Figure 3: Pre-test Infit MnSq Map**



**Figure 4: Post-test Infit MnSq Map**



Therefore, it was decided that the case estimates derived from this model would be used in subsequent examination of group differences using a one way Analysis of Variance (ANOVA) procedure. Table 9 presents the means for both the Control and Experimental schools on pre-test and post-test scores, while Graph 1 presents these data in graphic form.

**Table 9: Summary of pre-test and post-test means for Control School and Experimental School on Gagné-Nadeau questionnaire**

Mean Scores			
Control School		Experimental School	
Pre-test (n = 26)	Post-test (n = 20)	Pre-test (n = 41)	Post-test (n = 43)
0.167308	0.1095	0.303902	0.434186

**Graph 1: Plot of pre-test and post-test means for Control School and Experimental School on Gagné-Nadeau questionnaire**

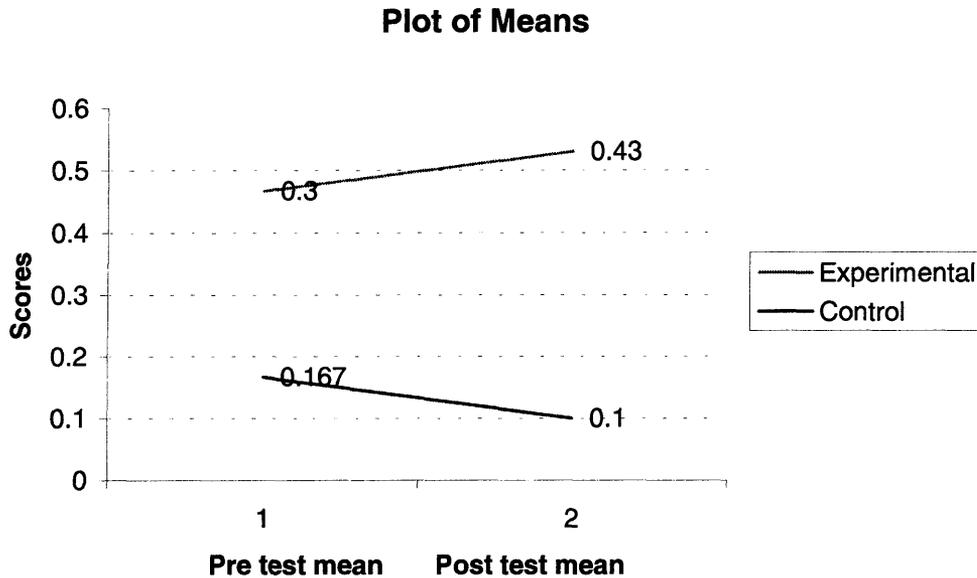


Table 10 presents a summary of the investigation undertaken on the set of group means using ANOVA.

**Table 10: Summary of ANOVA results on group means for Experimental School and Control School**

Degree of freedom Effect	Mean Square Effect	Degree of freedom Error	Mean Square Error	F ratio	P level
1, 3	0.648288	126	0.172186	3.765047	0.012509

It is evident from Table 10 that there is a significant difference between group means ( $F = 3.77$ ,  $df = 1, 3$ ,  $P = 0.013$ ).

The group means were then further investigated using the Tukey HSD test. This test revealed that the only significant difference was in the comparison between the Experimental and Control schools on post-test results. That is, the Experimental School on post-test, clearly exceeded the Control School on post-test. However, the Experimental group mean on pre-test also exceeded the

Control group mean on pre-test. That is, the Experimental School had more favourable attitudes toward giftedness and appropriate educational provision for gifted students at the time of pre-testing and that difference was increased on post-test results to the extent that it became statistically significant ( $P < .05$ ).

## **(ii) Qualitative**

### **Interview**

The research interview has been defined by Cannell and Kahn (1968, in Cohen & Manion, 1994:271) as a “two-person conversation initiated by the interviewer for the specific purpose of obtaining research-relevant information and focused by him [sic] on content specified by research objectives of systematic description, prediction or explanation.”

To fulfil the intentions of this study, semi-structured interviews were undertaken with each member of the stratified sample of teaching staff from the Experimental School. The main purposes of this data collection were to:

- validate other methods of data collection utilised by this study
- assess what the respondents know about the gifted and gifted education
- assess the effectiveness of specific features of the professional development program and explore why they did or did not work
- determine the use of specific instructional and management strategies aimed at providing for the individual needs of the gifted.

As it was also the intention of this study to obtain comparable data, an interview schedule was constructed so that the same questions could be asked in the same order and with the same wording of all respondents.

Each interview began with a fixed-alternative item (Cohen & Manion; 1994:276) which allowed respondents to choose from two alternatives. For example Question 1 asked “Has the professional development program altered

your ideas about the education of gifted students?" If respondents answered no they were asked, "Why do you think this is so?" whereas, if they answered yes they were then asked the open-ended question "In what ways?". From the answers to this question the researcher was able to make inferences about the direction of the attitudinal shift, the degree of the shift and the consequent stage of development achieved by the respondent.

Question 1ii and Question 2 were also open-ended questions providing a frame of reference for respondents' answers, while not restraining these answers nor their expression (Kerlinger, 1970 in Cohen & Manion, 1994). However, they were also different from one another in that they moved from dealing with general to specific issues. Question 1ii asked, "Which aspects of the program, if any, have been particularly influential in altering your ideas regarding the education of gifted students?". This is a non-specific question, which asks for general information and ideas. On the other hand Question 2 asked, "In what ways do you make provision for gifted students in your classes?". This is a specific question which asks for direct information about what is happening in the respondents' classroom and as such could be seen as the more threatening of the two. Consequently, it was placed as the last question.

These open-ended items were used because the researcher believed that they would facilitate a richness and intensity of response (Burns, 1994:350). Other than the subject of the question, there are no other restrictions on either the content or the manner of the respondents' reply. Therefore, open-ended questions have a number of advantages. Firstly, they are flexible, allowing the interviewer the option of probing into more depth or clearing up any misunderstandings. Secondly, they enable the interviewer to test the limits of the respondent's knowledge; they encourage cooperation and help establish rapport. Finally, they allow the interviewer to make a truer assessment of what the respondent really believes.

In an attempt to find meaning the data were then analysed. This was done by systematically organising, arranging and presenting the information thereby

facilitating comparisons, contrasts and insights to be made and demonstrated. The following five steps were used:

1. The first stage involved transcribing the interview tapes (see Appendix H).

2. Then a list of coding categories was developed. These coding categories were directly linked to the theoretical framework underlying the professional development program at the Experimental School. For example, the Stages of Development in Educators is based on the work of O'Donohue (in Rankin et al, 1990:19). The Professional Development Program reflects thee appropriate support strategies for classroom teachers at various stages of development (Rankin, Hole, Langdale & O'Donohue, 1990:20) and the Provision strategies for Gifted Students is based on the work of Eddie Braggett (1994). Codes were then constructed by abbreviating key words from the descriptors, i.e. SD = Stage of Development, PD = Professional Development Program and P = Provision strategies for gifted students. A detailed list of these researcher designated categories and sub-categories is as follows:

### **1. Attitudinal Shift**

- 1.1 DAS Direction of Attitudinal Shift
- 1.2 °AS Degree of Attitudinal Shift

### **2. Stage of Development**

- 2.1 SD1 Unaware
- 2.2 SD2 Sensitive to needs
- 2.3 SD3 Seeking knowledge and information
- 2.4 SD4 Ready to cater
- 2.5 SD5 Understanding what needs to be done
- 2.6 SD6 Providing skills and using new strategies
- 2.7 SD7 Successfully implementing in the classroom
- 2.8 SD8 Providing opportunities for meeting of like minds

### **3. Professional Development Program**

- 3.1 PD1 General seminars and workshops
- 3.2 PD2 Resource packages

- 3.3 PD3 Staff awareness displays
- 3.4 PD4 Mail box drops
- 3.5 PD5 Support teacher generated strategies
- 3.6 PD6 Classroom demonstrations
- 3.7 PD7 Individual consultation to assist with curriculum differentiation
- 3.8 PD8 Informal discussion groups with resource displays
- 3.9 PD9 Collegial construction and exchange of resources
- 3.10 PD10 Modelling for others
- 3.11 PD11 Greater involvement in networking
- 3.12 PD12 Support teacher assistance with review and evaluation
- 3.13 PD13 Involvement in committees
- 3.14 PD14 Research opportunities

#### **4. Provision Strategies for Gifted Students**

- 4.1 P1 Reducing the time they spend on the basics
- 4.2 P2 Omitting those parts of the course that they can already do
- 4.3 P3 Permitting them to speed up if they can work more quickly
- 4.4 P4 Allowing them to be more responsible for their own learning
- 4.5 P5 Changing my usual teaching strategies
- 4.6 P6 Providing for deeper thinking skills
- 4.7 P7 Encouraging and permitting students to extend knowledge understanding, skills processes etc.
- 4.8 P8 Allowing for the development of creative problem solving strategies and their application
- 4.9 P9 Providing the opportunity to apply one's knowledge and understanding to new situations
- 4.10 P10 Encouraging meaningful examination of social issues and conflict situations
- 4.11 P11 Developing enabling skills and performance skills
  - P11.1 Exploring
  - P11.2 Specialising
  - P11.3 Investigating/Research
  - P11.4 Self awareness
  - P11.5 Social Roles
  - P11.6 Cooperative learning
  - P11.7 Conflict resolution

P11.8	Fine and gross motor skills
P11.9	Coordination
P11.10	Enhanced performance
P11.11	Independence in decision making
P11.12	Self confidence
P11.13	Responsibility
P11.14	Motivation
P11.15	Moral strength
P11.16	Problem definition
P11.17	Creativity
P11.18	Higher order thinking
P11.19	Metacognition

#### 4.12 P.12 Extending the specific interests and understanding

3. In the margin of the transcript file the data were then coded. Codes could refer to a phrase, a sentence or a paragraph. Data could have more than one code allocated to them. In this instance coding operated as a labelling, retrieval and organising device (Burns, 1994:288).

4. Next data coded to each category were clustered using a card file system.

5. Finally, the researcher examined the clusters to determine the central theme/s.

### **Observation**

Cook and Selltiz (1977) believe that behaviour is a function of attitude, and therefore conclude that attitude can only be measured by observing behaviour (Cook & Selltiz, 1977:24). It was with this in mind that the research project undertook classroom observations of the members of the stratified sample of teachers from the Experimental School (for details of this group see Sampling Procedures, Section 4.4).

Observational techniques “yield data that pertain directly to typical behavioural situations” (Burns, 1994:262). Therefore, this technique was specifically included in the research design to provide illustrative data that would allow the researcher to compare what participants actually did with what they said they did, to provide for gifted students within their classes.

The observer tried to deal with both the teachers and the students in a natural, unobtrusive and non-threatening manner. However, she recognises that her very presence in the classroom changed the behaviour of the people she was trying to study. The observer interacted with the teachers and the students even if it was only non-verbally and therefore to some extent became a participant in the action. As described by Burns (1994), the line between participant and non-participant observation is a very fine one. However, for the purposes of this study the researcher accepts that non-participant observation was undertaken because the observer minimised her interaction with participants to focus attention unobtrusively on the stream of events. The “observer simply observed and recorded events as they naturally occurred” (Ary, Chester Jacobs & Razavich, 1996:483).

Behaviours related to the provision for gifted students were identified, categorised and recorded by an observer in the natural setting of the classroom. It was not the intention of this research project to quantify the frequency of behaviours, rather behaviours were examined to shed light upon the interview data regarding the provision made for gifted students by each member of the stratified sample.

Therefore, events were coded according to the following prespecified categories, which have been derived from to the “Provision Strategies for Gifted Students” categories constructed to code the interview data:

- Provide for deeper thinking skills
- Encourage and permit students to extend their knowledge, understanding, skills, processes, etc
- Allow for the development of creative problem solving strategies and their application
- Provide the opportunity to apply one's knowledge and understanding to new situations
- Develop enabling skills (Braggett, 1994) and performance skills
- Extend the specific interests and understandings of gifted students
- Provide the opportunity for the gifted to spend less time on the basics
- Allow the gifted to omit those parts of the course they can already do
- Permit the gifted to speed up if they can work more quickly
- Allow the gifted to be more responsible for their own learning.

A final limitation of the data collected for this component of the research project relates to the unreliability of events as they occur in a natural setting (Burns, 1994:361). The researcher recognises that she may not have seen some events simply because of the timing of her visits. Therefore, document analysis of selected lesson plans was used to provide further depth to the picture of provision that the researcher was constructing.

### **Document Analysis**

Lesson plans were scrutinized, using content analysis, to gather further illustrative data concerning how gifted students were provided for by members of the stratified sample from the Experimental School.

Content analysis has been described by Ary, Chester Jacobs and Razavich as a “research method applied to written or visual material for the purposes of identifying specified characteristics of the material” (1996:485). It was used in this instance to identify how provision for the gifted was undertaken by individual teachers within the classroom context. Therefore, coding categories duplicated those used for the analysis of the observational data and were linked to those constructed to code the interview data.

Elements were not counted in numerical terms, for frequency, but were examined for meaning. This presented several difficulties. Firstly, examining lesson plans for data concerning the provision for gifted students meant that the researcher often had to read between the lines, searching for hidden meaning. Secondly, some of the lesson plans analysed focused upon content and did not mention process. Therefore, it was impossible to identify how the teacher planned to differentiate for the gifted learners. Finally, lesson plans are not necessarily a true indication of practice. Therefore, these data were seen simply as explicating issues that had arisen as a result of the interviews and the classroom observations.

## 5.2 Discussion of results

### **(i) Quantitative**

Attitudes are descriptions of how people typically feel about or react to other people, things or ideas (Kubszyn & Borich, 1987 in Buchanan & Feldhusen, 1991:279) or how they tend to act or react when confronted with a certain stimulus (Oppenheim, 1966 in Buchanan & Feldhusen, 1991:279). “Opinions about the gifted and their education” (Gagné & Nadeau, 1991) is a 34-item questionnaire constructed to measure a subject’s attitudes towards the gifted and their education across six factors. The lowest possible score for any item was 1, while the highest possible score was 5. Therefore, scores should be seen as a position on a continuum ranging from very negative to very positive.

This research project used the latest version of the scale, for which norms were not available. However, Table 11 provides general guidelines as suggested by the authors of the questionnaire.

**Table 11: Attitude descriptors**

<b>Score Range</b>	<b>Descriptors</b>
5 - 4	Very Positive
3.99 – 3.26	Positive
3.25 - 2.75	Ambivalent
2.74 – 2.01	Negative
< 2	Very Negative

Gagné, 1991:2

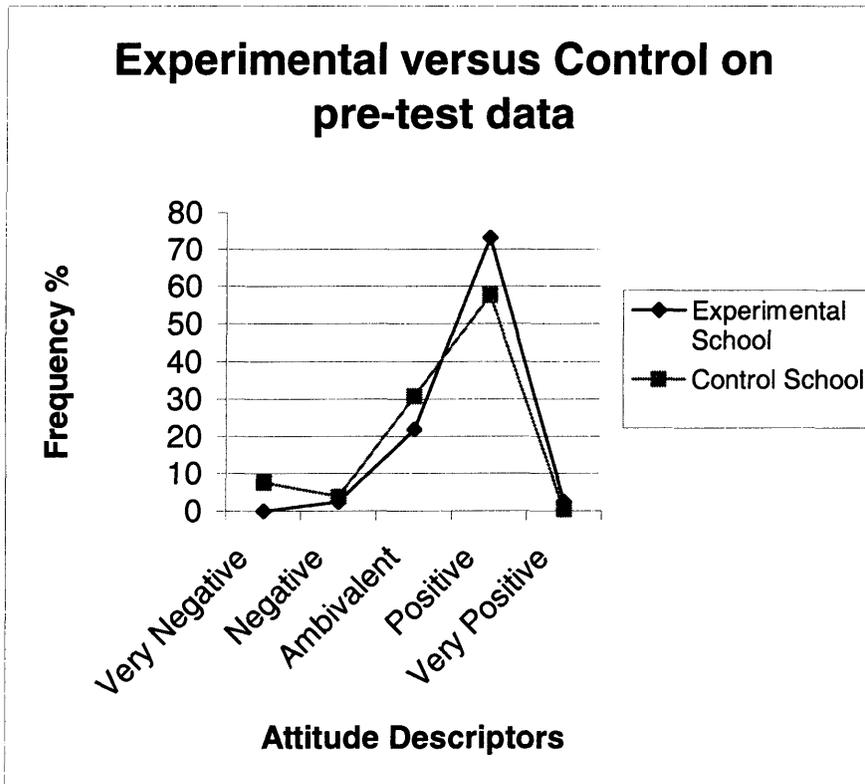
Initially descriptive analysis was undertaken on the global scores for the Experimental School versus the Control School on both pre-test and post-test results. These global scores were ascertained by tallying scores for each of the six factors.

An examination of the frequency distribution for the Experimental School versus the Control School on pre-test results for all factors combined (see Graph 2) reveals the following descriptive data:

- The schools generally presented a similar profile. The most frequently scored range for both schools was positive and there was an overall tendency for scores from both schools to cluster more near the positive end of the distribution than the negative.
- However, overall results for the Experimental School generally exceeded those of the Control School. Note the Control School's higher percentage of Very Negative and Ambivalent responses while the Experimental School presented a higher percentage of Positive and Very Positive responses.
- Overall this profile suggests that the Experimental School had more favourable attitudes toward giftedness and appropriate educational

provision for gifted students at the time of pre-testing than did the Control School.

**Graph 2: Experimental School versus Control School on pre-test results**

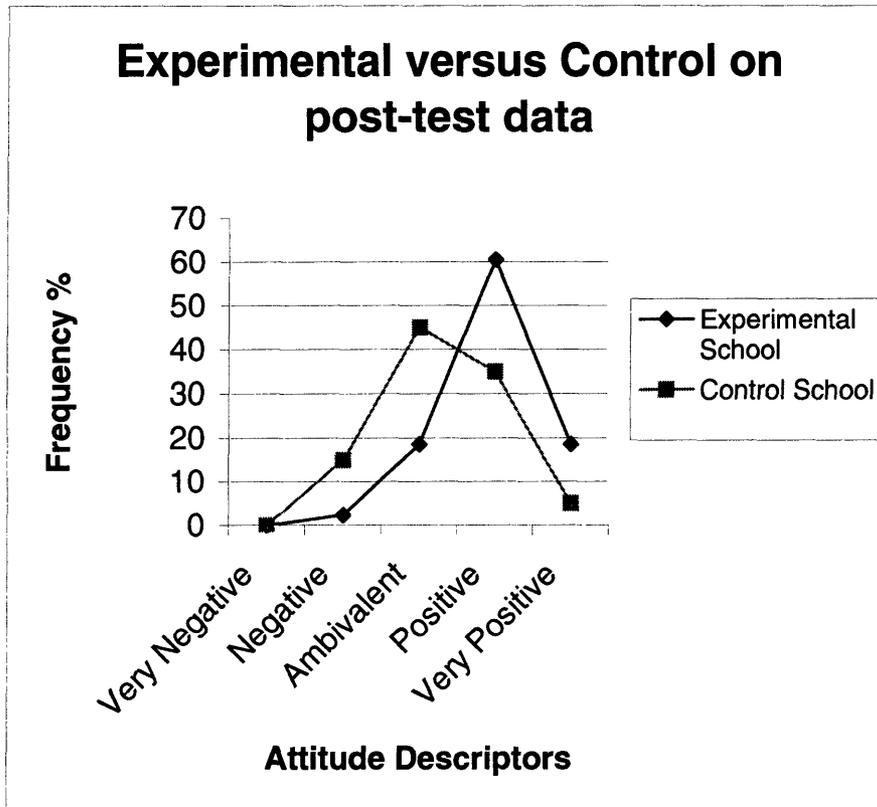


An examination of the frequency distribution for the Experimental School versus the Control School on post-test results for all factors combined (see Graph 3) reveals the following descriptive data:

- Overall, post-test results for the Experimental School clearly exceeded those for the Control School. Note the overall upward shift of results for the Experimental School and the overall downward shift of results for the Control School.
- This profile suggests that the difference identified in the pre-test data presented in Graph 2 were markedly increased on the post-test results. Therefore, the Experimental School teachers had clearly increased their percentage of favourable attitudes toward giftedness and appropriate educational provision for gifted students by the end of the study.

- It is also interesting to note that responses for the Control School, as measured by the post-test, suggested that their attitudes toward giftedness and appropriate educational provision for gifted students had become more ambivalent by the end of the study.

**Graph 3: Experimental School versus Control School on post-test results**



To examine the differences located on the above graphs it was necessary to examine each of the factors in turn.

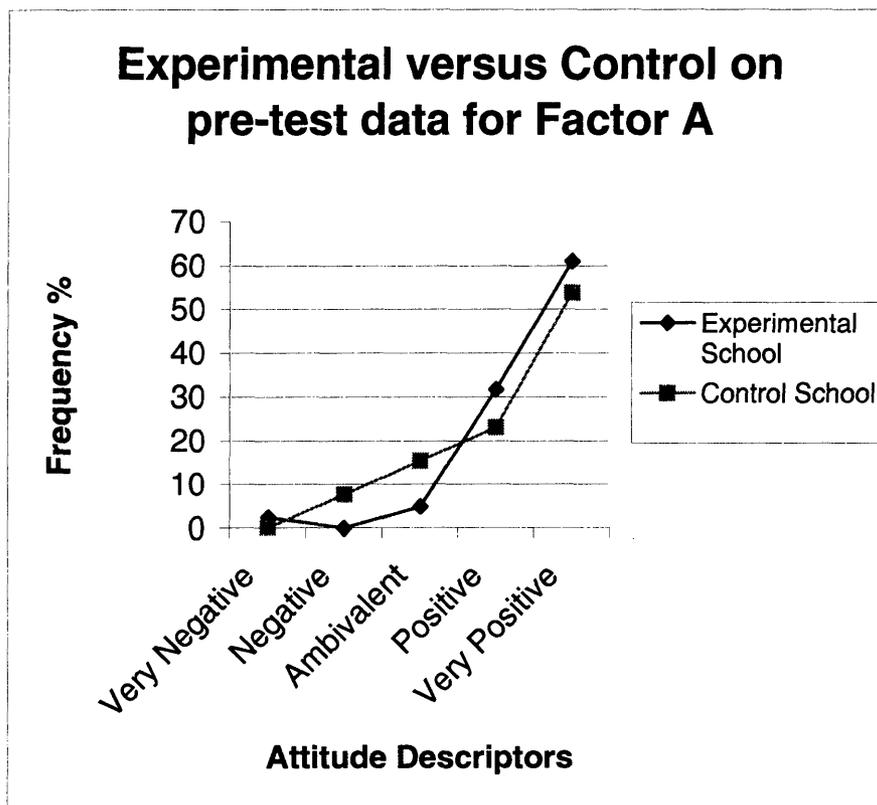
Factor A addressed a respondent's awareness of the needs of the gifted. Two typical items from the questionnaire are as follows:

- **The gifted need special attention in order to develop fully their talents.**
- **Since we invest supplementary funds for children with difficulties, we should do the same for the gifted.**

An examination of the frequency distribution for the Experimental School versus the Control School on pre-test results for Factor A (see Graph 4) reveals the following descriptive data:

- Once again, overall results for both the Experimental School and the Control School presented a similar profile. In both cases the most frequently scored range was Very Positive. In both cases there was an overall tendency for scores to cluster more near the positive end of the distribution than the negative.
- However, results for the Experimental School, once again, generally exceeded those of the Control School. Note the marginally higher percentage of Positive and Very Positive responses for the Experimental School.
- Overall, this profile suggests that both groups began the study with a positive attitude to recognising the needs of the gifted and a positive attitude toward the offer of special services to provide for the gifted.

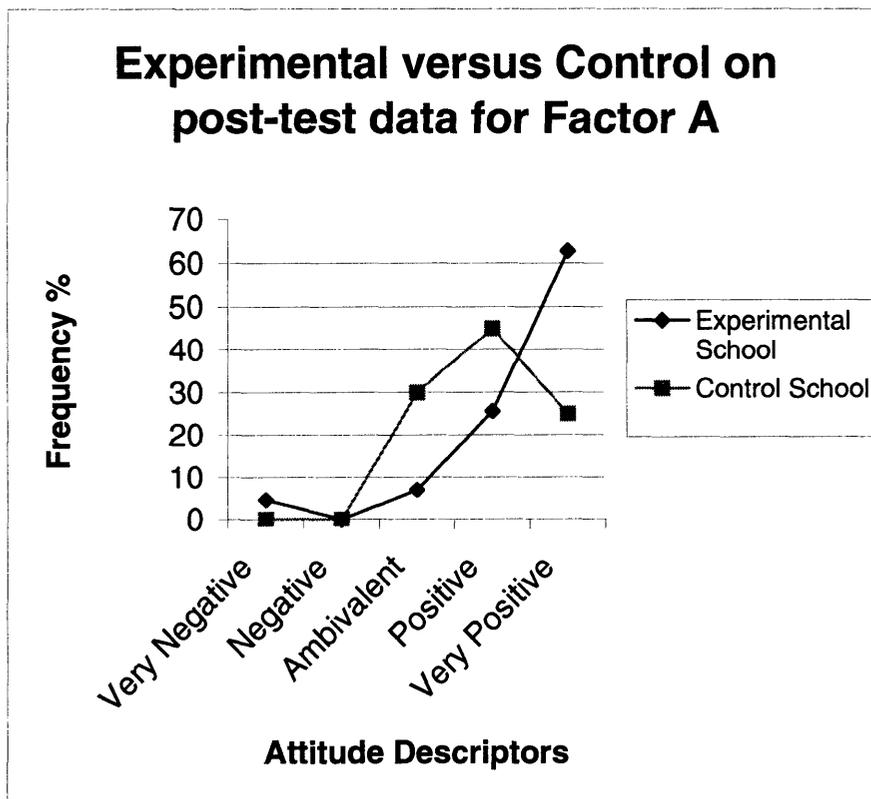
**Graph 4: Experimental School versus Control School on pre-test results: Factor A**



An examination of the frequency distribution for the Experimental School versus the Control School on post-test results for Factor A (see Graph 5) reveals the following descriptive data:

- Overall results for the Experimental School have remained relatively consistent with pre-test results, while results for the Control School reflect an overall downward shift. Specifically, the Control School now presents the most frequently scored range as Positive and not Very Positive. Generally, there is more of a tendency for scores to cluster in the Ambivalent range rather than the Positive to Very Positive range as presented in Graph 4.
- This profile raises some interesting questions. Why did the intervention undertaken by the Experimental school not impact upon staff attitudes toward recognising the needs of the gifted and for appropriate services to provide for these needs? Was this linked to the pre-existing high levels of positive and very positive attitudes as measured by the pre-test data? Or was it linked to the downward shift in positive attitudes as exhibited by the Control School's post-test results? In essence what had caused the status quo for the Experimental School and conversely what had caused the downward shift for the Control School?

**Graph 5: Experimental School versus Control School on post-test results: Factor A**



Factor B addressed a respondent's objections to providing for gifted learners based on their ideology and priorities. Two typical items from the questionnaire are as follows:

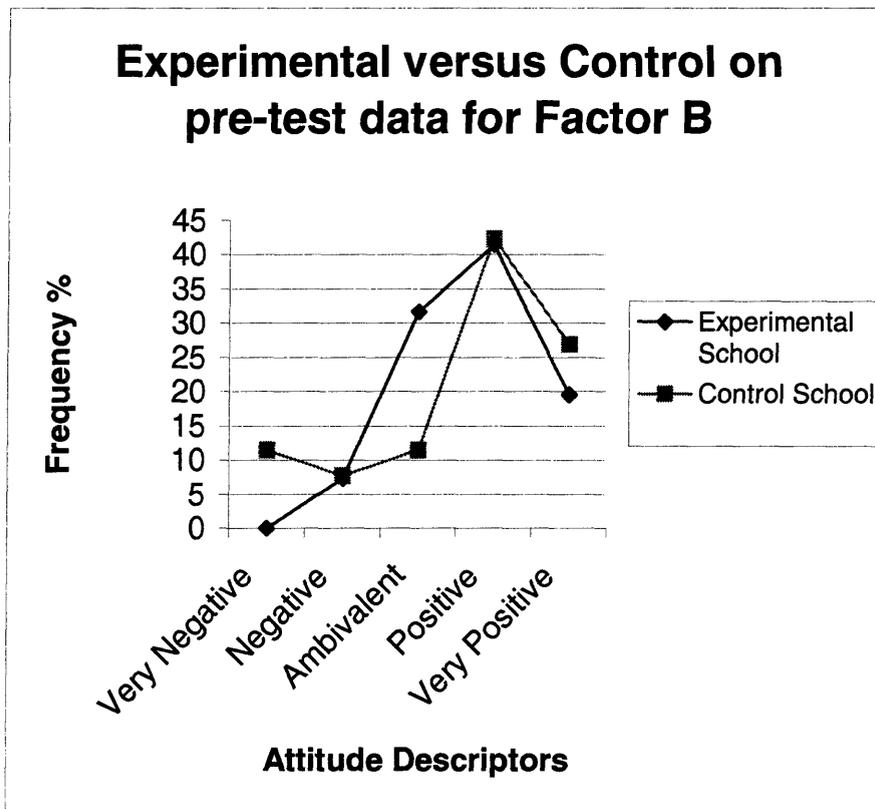
- **We have a greater moral responsibility to give special help to children with difficulties than to gifted children.**
- **Gifted children might become vain or egotistical if they are given special attention.**

[Here it is important to note that both items above are formulated negatively, thus positive attitudes are indicated by disagreement with these items.]

An examination of the frequency distribution for the Experimental School versus the Control School on pre-test results for Factor B (see Graph 6) reveals the following descriptive data:

- Overall results for both the Experimental School and the Control School have a tendency to cluster more near the positive end of the distribution than the negative. In both cases the most frequently scored range is Positive. Therefore, this profile suggests that both groups began the study with a relatively positive attitude to providing for gifted learners based on their ideology and priorities.
- However, once again, results for the Experimental School generally exceeded those of the Control School.

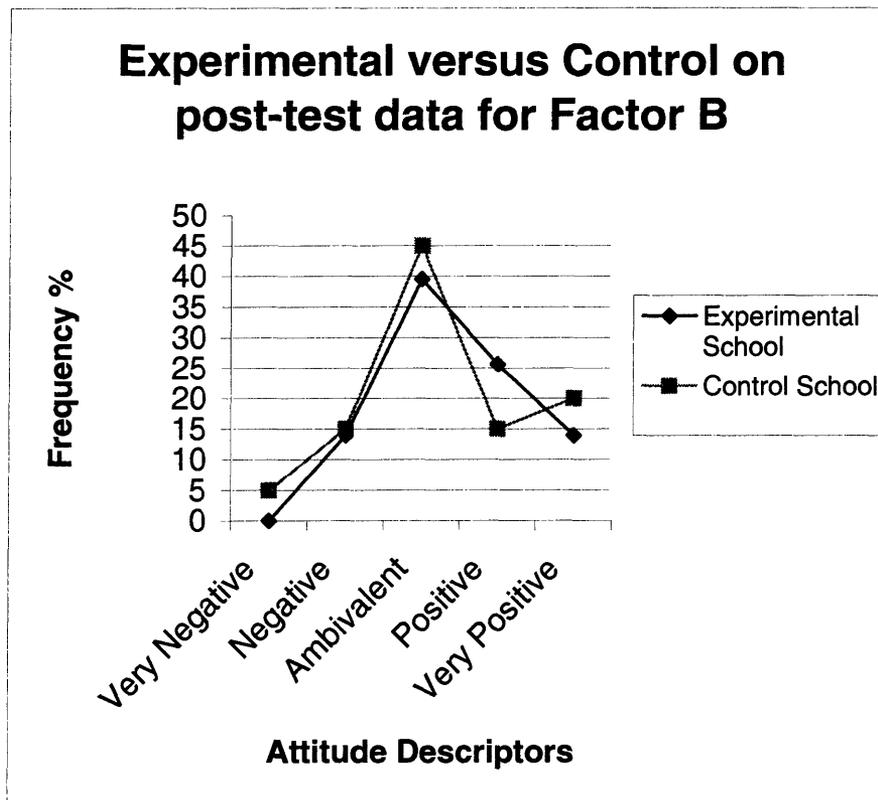
**Graph 6: Experimental School versus Control School on pre-test results: Factor B**



An examination of the frequency distribution for the Experimental School versus the Control School on post-test results for Factor B (see Graph 7) reveals the following descriptive data:

- There has been an overall shift in the profile of responses for both the Experimental School and the Control School. The most frequently scored range is now Ambivalent. Note that the percentage of scores at the positive end of the distribution for the Experimental School has actually dropped, while the percentage of scores at the positive end of the distribution for the Control school has increased.
- This profile raises some interesting questions. Why have scores for both the Experimental School and the Control school shifted to cluster near the centre of the distribution? We need to look to the qualitative data to try to understand what may have impacted upon the respondents' objections to providing for gifted learners based on their ideology and priorities.

**Graph 7: Experimental School versus Control School on post-test results: Factor B**



Factor C addressed the respondent's attitude towards the social usefulness of gifted persons in society. Two typical items from the questionnaire are as follows:

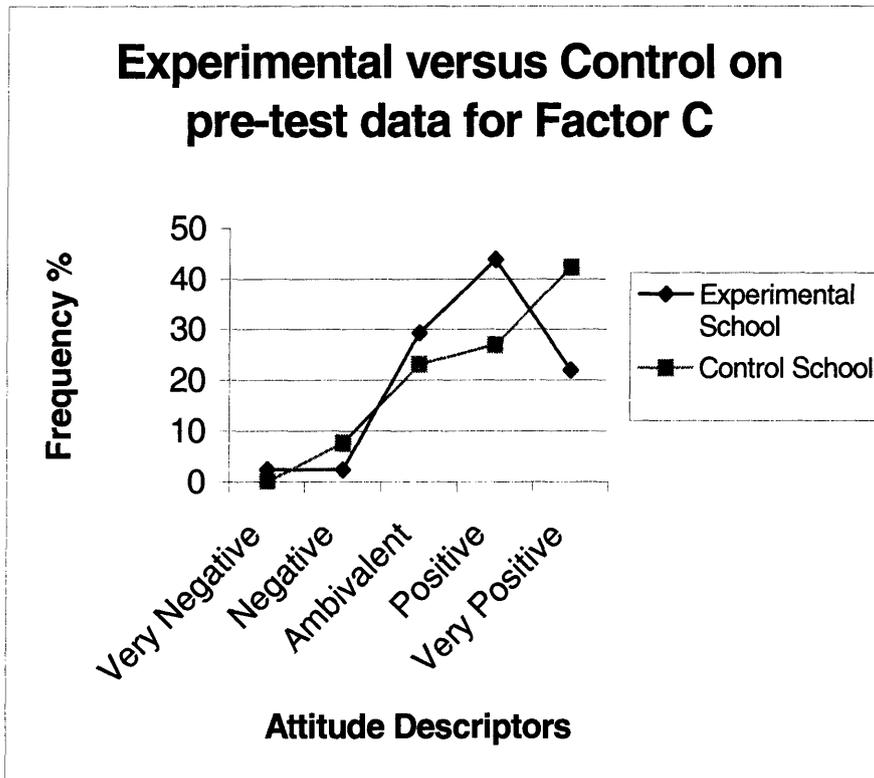
- **Gifted persons are a valuable resource for our society.**
- **The leaders of tomorrow's society will come mostly from the gifted of today.**

An examination of the frequency distribution for the Experimental School versus the Control School on pre-test results for Factor C (see Graph 8) reveals the following descriptive data:

- Both school profiles demonstrated a clear tendency for scores to cluster near the positive end of the distribution. Therefore, at the commencement of the study both schools presented as having positive attitudes toward the social usefulness of gifted persons.

- However, this profile also suggests pre-test differences between the Experimental School and the Control School's attitudes toward the social usefulness of gifted persons. The most frequently scored range for the Experimental school was Positive, while for the Control school it was Very Positive.

**Graph 8: Experimental School versus Control School on pre-test results: Factor C**

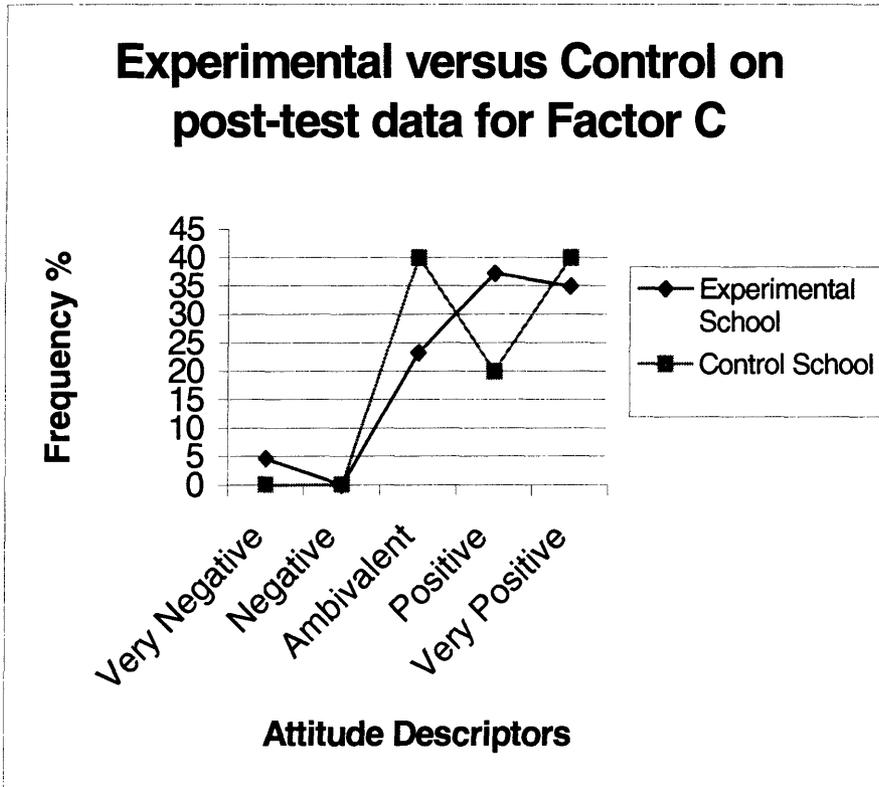


An examination of the frequency distribution for the Experimental School versus the Control School on post-test results for Factor C (see Graph 9) reveals the following descriptive data:

- There is still an overall tendency for post-test scores to cluster at the positive end of the distribution. This tendency has been sustained for the Experimental School, with the most frequently scored range still being Positive and with a slight increase in Very Positive responses. The Control school on the other hand has clearly shifted its profile toward the positive end of the distribution. The most frequently scored range for the

Control school is now Very Positive and Ambivalent. There are no longer any responses, which fall in the Negative or Very Negative range.

**Graph 9: Experimental School versus Control School on post-test results: Factor C**



Factor D addressed the respondent’s attitude towards the rejection of gifted persons by others in the immediate environment

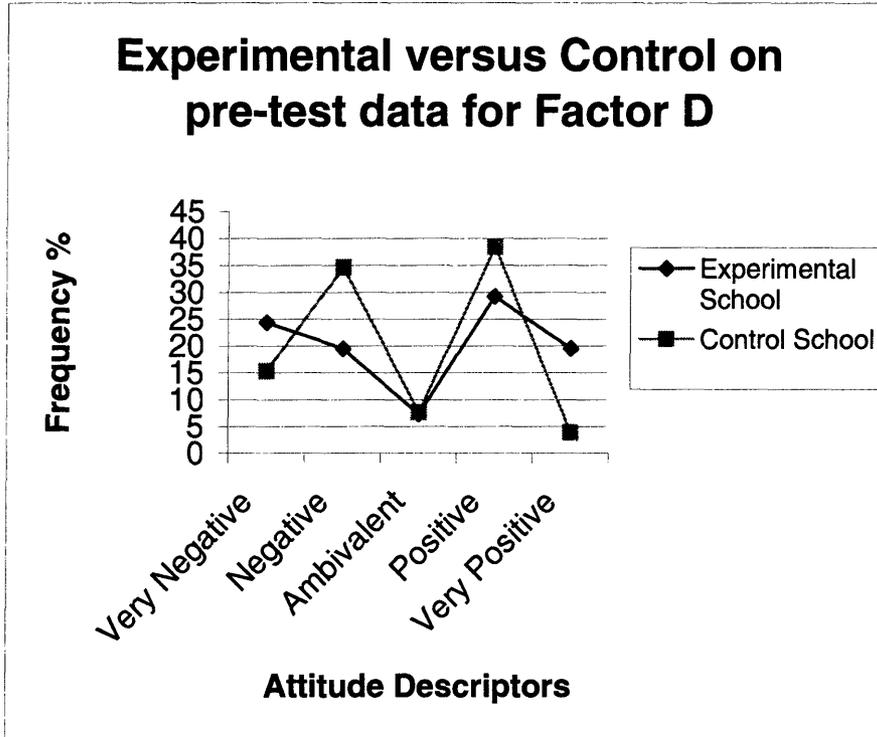
- **A child who has been identified as gifted has more difficulty in making friends.**
- **Some teachers feel their authority threatened by gifted children.**

An examination of the frequency distribution for the Experimental School versus the Control School on pre-test results for Factor D (see Graph 10) reveals the following descriptive data:

- This profile suggests that both schools, on pre-test data, generally presented similar profiles regarding respondents’ attitude towards the rejection of gifted persons by others in the immediate environment.

There was an overall tendency for scores to cluster at either end of the distribution. It is interesting to note that respondents' attitudes clearly fell into two distinct camps. This appears to be an issue that left little room for ambivalent responses.

**Graph 10: Experimental School versus Control School on pre-test results: Factor D**

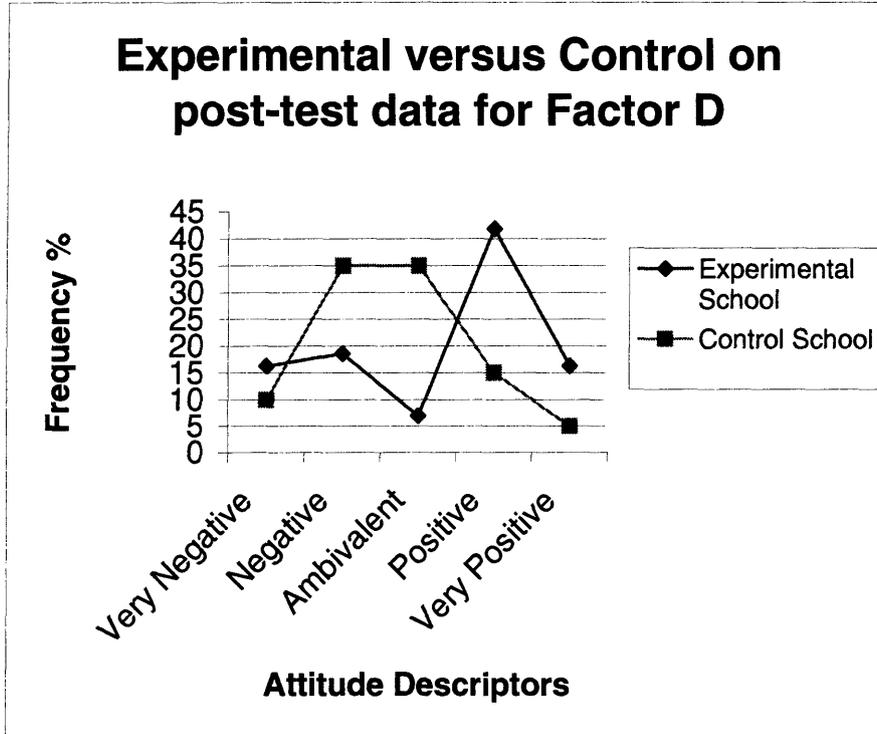


An examination of the frequency distribution for the Experimental School versus the Control School on post-test results for Factor D (see Graph 11) reveals the following descriptive data:

- Post-test data present an interesting picture of the shifting attitudes of both the Experimental school and the Control School. Firstly, the profile of the Experimental School has clearly shifted to the positive end of the distribution. The most frequently scored range is still Positive but the percentage of responses in this range has clearly increased. Similarly, the percentage of Very Negative responses has decreased. Secondly, the profile of the Control School has clearly shifted to the middle and negative end of the distribution. The most frequently scored range is

now Ambivalent and Negative with the percentage of Positive scores having fallen dramatically.

**Graph 11: Experimental School versus Control School on post-test results: Factor D**



Factor E addressed the respondent’s attitudes towards ability grouping of gifted students. Two typical items are as follows:

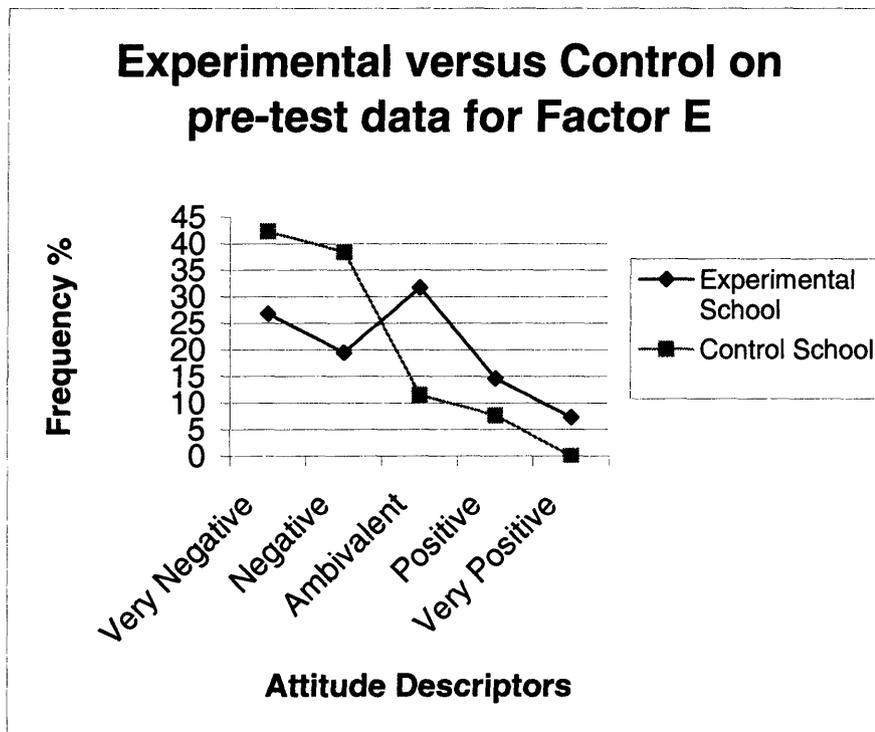
- **Gifted children should be left in regular classes, since they serve as an intellectual stimulant for other children.**
- **By separating students into gifted and other groups, we increase the labelling of children as strong-weak, good-less good etc.**

[Again, it is important to note that both items are formulated negatively, thus positive attitudes are indicated by disagreement with these items.]

An examination of the frequency distribution for the Experimental School versus the Control School on pre-test results for Factor E (see Graph 12) reveals the following descriptive data:

- Australian educators frequently voice concerns regarding the differentiation of curriculum through the use of ability grouping (Gross, 1994, 1997; Goldberg, 1981; Senate Select Committee, 1988; AAEGT, 1998). This profile of pre-test results for both the Experimental School and the Control School reflect these concerns. There is a clear tendency for responses from the Control School to cluster at the negative end of the distribution. The most frequently scored range is not surprisingly Very Negative. The Experimental School however, began this study with a somewhat more ambivalent attitude toward the ability grouping of gifted students. Even so there was still a strong tendency for scores from the Experimental School to cluster more near the negative end of the distribution than the positive end.

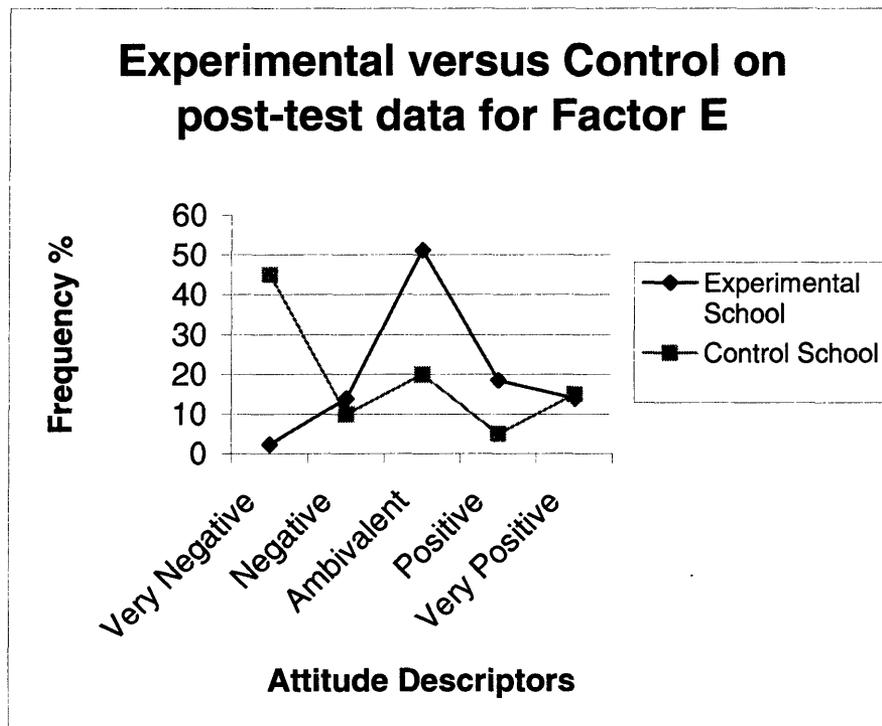
**Graph 12: Experimental School versus Control School on pre-test results: Factor E**



An examination of the frequency distribution for the Experimental School versus the Control School on post-test results for Factor E (see Graph 12) reveals the following descriptive data:

- Interestingly, the post-test profile of responses for both the Experimental School and the Control School demonstrate a shift in attitude towards this controversial issue. The most frequently scored range for the Experimental School is still Ambivalent, but the percentage of these responses has increased. Also interesting is the decrease in Negative responses and the corresponding slight increase in Positive and Very positive responses. The most frequently scored range for the Control School is still Very Negative but the percentage of Negative responses has decreased considerably. Similarly, the Control School has now recorded an increase in Very Positive responses.

**Graph 13: Experimental School versus Control School on post-test results: Factor E**



Factor F addressed the respondent's attitudes towards acceleration of gifted students. Two typical items are as follows:

- **Most gifted children who skip a grade have difficulties in their social adjustments to a group of older students.**

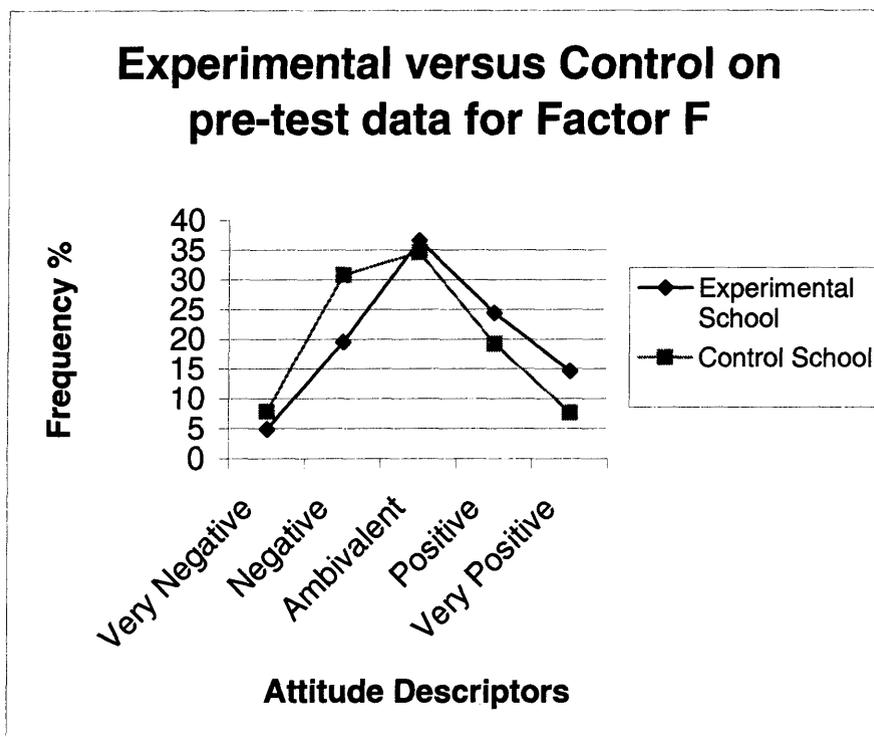
- **When skipping a grade, gifted students miss important ideas (they have ‘holes’ in their knowledge).**

[Once again, both items above are negatively formulated so that disagreement reflects a positive attitude.]

An examination of the frequency distribution for the Experimental School versus the Control School on pre-test results for Factor F (see Graph 14) reveals the following descriptive data:

- The schools, on pre-test data, generally presented similar profiles. The most frequently scored range for both schools was Positive and there was an overall tendency for scores from both schools to cluster more near the middle of the distribution.
- However, results for the Control School are slightly more skewed to the negative end of the distribution with lower percentages of scores in the Positive and Very Positive ranges and a higher percentage of responses in the Negative range.
- Overall this profile suggests that the Control school had a slightly more negative attitude towards the acceleration of gifted students as measured at the beginning of this study.

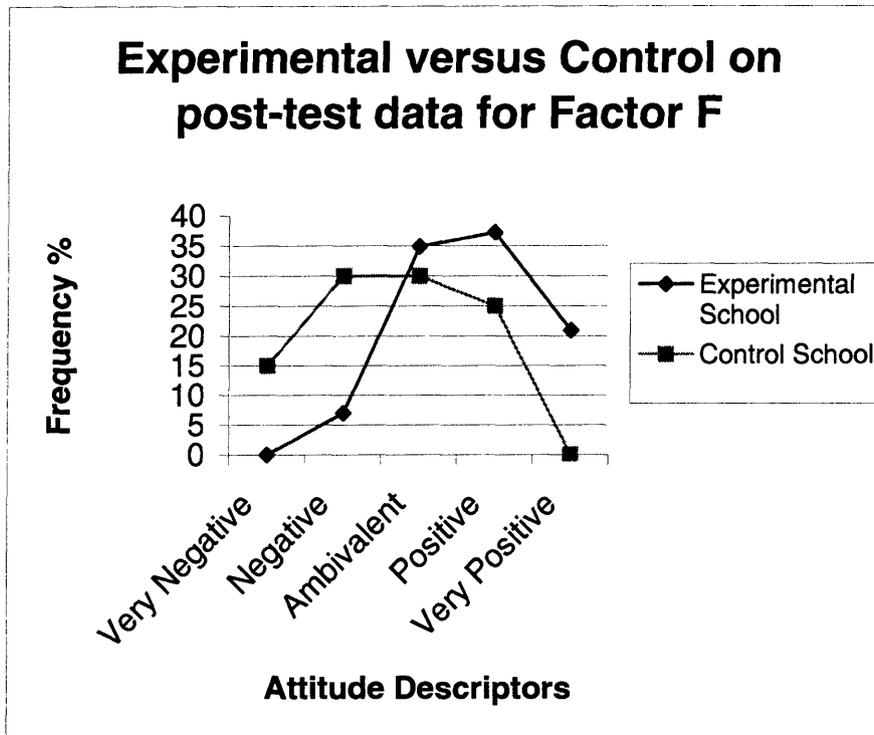
**Graph 14: Experimental School versus Control School on pre-test results: Factor F**



An examination of the frequency distribution for the Experimental School versus the Control School on post-test results for Factor F (see Graph 15) reveals the following descriptive data:

- Once again post-test data present an interesting picture of the shifting attitudes of staff at both the Experimental School and the Control School.
- Overall responses for the Experimental School now have a tendency to cluster at the positive end of the distribution. The most frequently scored range is now Positive and the percentage of Very Positive responses has also increased.
- On the other hand responses for the Control School now have a tendency to cluster more near the middle and the negative end of the distribution. The most frequently scored range for the Control School is now Negative and Ambivalent. There has also been a clear increase in the percentage of Very Negative responses and a decrease in the percentage of Very Positive responses.

**Graph 15: Experimental School versus Control School on post-test results: Factor F**



This descriptive analysis set the scene for the subsequent examination of group differences using a one way Analysis of Variance (ANOVA) procedure. It was evident from the investigation undertaken on the set of group means using ANOVA that there was a significant difference between the group means (as was shown earlier in Table 10, p64).

**(ii) Qualitative**

“So complex and involved is the teaching-learning process in the context of the school that the single-method approach yields only limited and sometimes misleading data” (Cohen & Manion, 1994:238). Therefore, methodological triangulation was used as the researcher believed that it had the most to offer in the educational setting in which this research project took place (Cohen & Manion, 1994:236). A summary of the relationship between the research questions examined and the methodologies used was presented in Chapter 4 (see Table 4, p40).

The interview data acted as the skeleton on which the flesh was the detail provided by the classroom observations and the document analysis. Therefore, the following discussion of results will consider each interview question in turn, using the data from the observations and the document analysis to describe, explain and qualify, where necessary.

### **Question 1a**

In answer to the question “Has the professional development program altered your ideas about the education of the gifted?” all participants responded positively. Further transcript analysis, coupled with analysis of both classroom observations and lesson plans, attempted to identify the direction and the degree of the attitudinal shift.

#### *The direction of the attitudinal shift*

All participants spoke of the impact of the professional development program on their awareness of both the gifted learner and gifted educational provision. For example, Participant F explained that the program “educated me and changed my perceptions” (Line 13). Similarly, Participant G described the program as having “opened my mind” (Line 15) and “made me more aware” (Line 12). Likewise Participant B described how the program was “very stimulating” (Line 8) making her more aware of how “to cater for those individual differences within [her] classes” (Lines 9 & 10).

For some participants however, the program simply reinforced ideas already held. For example, Participant E described how the program “confirmed what I do in my classes” (Line 8). For other participants the program not only confirmed ideas, it focused these ideas into action. For example, Participant I explained, “I always have come into teaching with an appreciation of the needs of gifted students. More so, the professional development program has tended to um, concentrate my focus on strategies and program ideas.” (Lines 8 - 11) Participant H also spoke of the program as “focusing my ideas” (Line 8).

Finally, the program was seen to reinforce ideas and yet also to challenge participants' thinking about the gifted and the education of the gifted. For example, Participant J described how the professional development program reinforced general ideas that were held about gifted learners and then how there was an "altering of my understanding of a definition" (Lines 21 & 22) and how it "altered my ideas in terms of the broad spectrum of all subjects where we can use it" (Lines 14 & 15).

### *The degree of the attitudinal shift*

The degree of the attitudinal shift across the participants ranged from small to large. Four (C, D, E and I) of the ten participants recorded a small degree of shift. This judgment was made after an analysis of their transcripts, lesson plans and classroom observation sheets seemed to indicate only a small shift relating to how far these participants had moved in terms of their attitudes toward the gifted and gifted education. Both Participant I and Participant D indicated during the interview that a small shift in attitude had occurred. However, an analysis of the record sheets for the classroom observation undertaken within their classes and of the lesson plans they submitted revealed that both of these teachers were already implementing successful programs within their classrooms (Document Analysis and Classroom Observation recording sheets for Participant D and I). During their interviews, both participants expressed a very positive attitude toward the gifted and gifted education. For example Participant I responded to the first question by saying, "in some ways yes, but I always have come into teaching with an appreciation of the needs of gifted students." (Lines 8 & 9) On the other hand, Participant C and Participant E presented small shifts in attitudes despite having registered an increased awareness. Participant C explained that "while I thought it was important, I now think it is even more important" (Lines 8 & 9), yet this same participant expressed stereotypical views of the gifted learner and was unable to see how the learning needs of these students could be provided for in anything other than a segregated setting (Document Analysis and Classroom Observation recording sheets for Participant C). In a similar way, Participant D described how she, "probably wasn't particularly aware of gifted children"

(Line 10) but now sees herself as being more aware. Once again this participant had experienced only a small degree of shift because she had isolated the knowledge to one context (Document Analysis and Classroom Observation recording sheets for Participant D) and had not developed fully the implications of the ideas.

Two participants (B and J) demonstrated a medium shift in attitude toward the gifted and gifted education. During her interview Participant J spoke of a consolidation of what was known and of adjustments to an understanding of definition, and a broadening of the application of strategies. An analysis the record sheets both for the classroom observation undertaken within her classes and of the lesson plans she submitted revealed the development of a clearer understanding of gifted education (Document Analysis and Classroom Observation recording sheets for Participant J). During her interview Participant B also spoke of how “very stimulating” (Line 8) the program had been in terms of challenging her understanding of who the gifted were, and how she could cater for their needs. In a similar way, an analysis of the record sheets both for the classroom observation undertaken within her classes and of the lesson plans she submitted exposed her developing confidence in providing for the gifted learner within her classes (Document Analysis and Classroom Observation recording sheets for Participant B). For example, lesson plans submitted at the start of the year reflected strategies that had been built into a common Year 8 English unit by the Resource teacher. They included pre-testing, self paced and self selected work negotiated through contract and a focus on Bloom’s Taxonomy. A later lesson plan written by Participant B for a Year 10 Geography class also included self pacing, student choice of topic and product, and open-ended, ‘What if . ?’ questions based on the Q Matrix.

Finally, four participants (A, F, G and H) underwent a large shift in attitude as described by them during the interview process, and as demonstrated by their lesson planning and classroom practices. These participants’ responses were characterised by expressions like “most definitely” (Participant F, Line 8), “big

impact” (Participant F, Line 25), “influenced [me] very much” (Participant H, Line 9), “really important” (Participant G, Line 19), “changed markedly” (Participant A, Line 32). In particular Participant A outlined the degree of her shift in attitude by describing how previously she “would have been very resistant to the idea of giftedness and the provision for the gifted” (Lines 113 & 114), to the extent where she describes herself as being “one of the greatest white-anters” (Line 116) of such a program. Now this participant is actively involved in providing for the learning needs of these students regularly in her classes (Document Analysis and Classroom Observation recording sheets for Participant A). For example, Participant A has written and run five workshops as part of the school’s enrichment cluster program for gifted students. Similarly, Participant F explained how changing schools had been a turning point for her in her development in this area. “It was always something I was interested in but there was never an opportunity in my other schools to find out anything about it or anybody on staff with the expertise to talk to about it” (Participant F, Lines 29 - 31). During her interview, Participant G clarified how the professional development had “opened my mind up to the fact that we can, even in so small a way, access them” (Lines 15 & 16). In the past she often felt an inability to provide for the gifted and continue to support the other members of her class and yet she demonstrated through her lesson planning and classroom practices that she can provide for the gifted within her classroom program (Document Analysis and Classroom Observation recording sheets for Participant G). For example, Participant G demonstrated her ability to differentiate tasks by incorporating creative thinking strategies into her regular classroom program. Finally, Participant H discussed during her interview and demonstrated through her lesson planning and classroom practices an increased awareness “of the range of abilities and different learning approaches of students” (Lines 11 & 12) within her classes. For example, she planned and taught an Australian Poetry unit to Year 11 students which was specifically aimed at responding to the individual differences that existed within the group. Firstly, the unit built upon students’ prior knowledge, and empowered them to respond to poetry by teaching them simple tools of deconstruction, ie de Bono’s Six Thinking Hats and 5Ws + H. Secondly, it was built around the concept of multiple intelligences and finally, it involved

some self-assessment and reflection. Participant H demonstrated how this consciousness of individual differences that she had spoken of during her interview had fuelled her change in attitude towards the gifted (Lines 10 - 13).

Additional reflective information on the success of the program, as she had experienced it, was also provided by Participant F. She described the program as being “very successful” (Line 19) because it was a “sideways filter of information” (Lines 18 & 19) which came to people in an “informal way” (Line 20). Because of this informality she believed that people were then able to “embrace it at a time when they have been more relaxed.” (Lines 20 & 21) Material was always seen to be available but it was there on a “needs to know basis” (Line 22) providing for participants “when they have been looking for something.” (Lines 21 & 22) These insights reflect many of the aims of the professional development program implemented by the Experimental School.

#### *Stage of development*

The overall stage of development attained by each of the respondents in relation to their understanding of giftedness and the educational provisions for the gifted was then ascribed, based on data gathered during the interview, from an examination of classroom observation record sheets and from content analysis of submitted lesson plans. This label was directly related to the model for professional development that was undertaken by the Experimental School, “Making Change Happen” (Queensland Department of Education, 1994) - see Chapter 3 and Appendix C. Participants’ stage of development ranged across the eight levels.

During her interview, Participant A was very clear in her understanding of the interconnection between a broader definition and the unique learning style of the gifted. For example, she stated that she had come to realise that there was a “totally different feel to giftedness” (Lines 18 & 19) and that the gifted “do learn very differently” (Lines 15 & 16). At the level of provision, Participant A exhibited a clear appreciation of what needs to be done (SD5 - see pp.67 –

69 for the list of coding categories). Her comment “you have to be prepared to let them work in thirty different ways” (Line 46) illustrates this. Similarly, her lesson planning and classroom practices were characterised by flexibility and divergence (Document Analysis and Classroom Observation recording sheets for Participant A). She also demonstrated her understanding of how difficult this can be for some teachers, and perhaps provided insight into how far she had travelled, when she said, “for a lot of people, that is very confronting” (Lines 51 & 52). Finally, Participant A, referred to and demonstrated many varied examples of how she was successfully implementing gifted education in the classroom (SD7). In particular, Participant A developed the enabling skills of her students (P11), encouraging them to be responsible for their own learning (P4) by allowing them options when choosing learning pathways (P1, P2, and P3) (Document Analysis and Classroom Observation recording sheets for Participant A).

Participant B, on the other hand, was not as far advanced in her development. Her response to the interview questions, coupled with data gathered as a result of an examination of her classroom observation record sheets and content analysis of submitted lesson plans, led the researcher to the conclusion that she was still grappling with the complexity of the issue of provision for the gifted. Therefore, she was operating at a level where she was practising skills and trialling new strategies (SD6). She was very sensitive to the learning needs (SD2) of the gifted and this had clearly impacted upon her desire to seek knowledge and information (SD3) concerning how to respond to these needs. For example, she spoke at length about the hidden gifted and the social and emotional needs of the gifted learner (Lines 15 - 17, Lines 22 -23 and Lines 30 -36) and she emphasised the “huge responsibility” (Line 44) that she felt to respond appropriately to these students.

Participant C was also sensitive to the learning needs of the gifted (SD2) (Lines 63, 74, and 75 & 76) but she seemed weighed down by an inability to see how to respond in a mixed ability classroom. She provided an excellent example of

someone who demonstrated a marked difference between attitude and practice. She could see that some gifted learners have a better vocabulary, can make connections and are good at lateral thinking (SD2) but at other times her views were stereotypical and her ideas for provision were invariably prefaced with the words “you can’t” (SD1). For example, she explained how “you can’t send them off to the library (Lines 24 & 25) ...you can’t put them in another area because they are missing out on something (Line 25)... you can’t time it (Line 92).” Similarly, her classroom provision was characterised by a lock step approach (Document Analysis and Classroom Observation recording sheets for Participant C) with little flexibility and no differentiation for the individual. While she resolved that “fairness is important” (Line 49), she seemed to equate fairness with everyone doing the same thing at the same time: “You must offer the same to everybody” (Line 49 & 50). Her lament became if only we “could separate them out” (Line 91) and “take them on their own” (Line 141). Therefore, Participant C represented someone who was seeking knowledge and information (SD3) particularly about how to provide for gifted students in her mixed ability classroom.

Overall, Participant D presented as someone who was unaware (SD1) of the gifted and the need to provide for gifted students within her class. In her own words she described how she “certainly wasn’t aware” (Lines 12 & 13) of the unique characteristics of the gifted learner and several times during the interview she seemed uncertain about the provision that she offered the gifted within her classroom. For example, when asked ‘In what ways do you make provision for gifted students in your classes?’ she exclaimed that, “I would have said I don’t, but I probably do” (Line 57 - 58). She went on to say that she felt a form of natural selection occurred within her subject area that meant many of her students were the “brighter” (Line 79) ones. However, she had co-written, and taught, (SD7) an enrichment unit which specifically catered for the needs of a mixed ability class (Document Analysis and Classroom Observation recording sheets for Participant D) and as Head of Department had fought for this unit to remain in the program because she had “felt that [it] was just so beneficial” (Lines 30 & 31). Finally, Participant D ended the interview

pondering how she could transfer this experience to other year levels and setting this as a challenge for herself for the next academic year (Line 90). In this way she represented someone who was seeking further knowledge and information (SD3).

Participant E represented someone who was keen to seek knowledge and information (SD3). For example, she described herself as always showing an “interest in wanting to learn more” (Lines 62 & 63). She was successfully implementing strategies in her classroom (SD7) (Document Analysis and Classroom Observation recording sheets for Participant E) and she had created opportunities for meeting of like minds (SD8) through running workshops for the “Days of Excellence Program”, an interschool enrichment program (Document Analysis and Classroom Observation recording sheets for Participant E). However, she seemed to lack any meaningful philosophy (SD1) and responded to perceived student needs intuitively: “it is just the way I teach” (Lines 14 & 15), she explained.

Participant F also spoke of her ongoing interest in this area, “it was always something I was interested in” (Line 29). She went on to describe how she had developed her skills and the use of new strategies within the classroom (SD7) and was now successfully implementing (SD7) these as a given component of the program (Document Analysis and Classroom Observation recording sheets for Participant F). Scrutiny of lesson plans demonstrated that Participant F had altered tasks to increase their complexity, she had built in choice wherever possible and extended the enabling and performance skills of her students (SD7). For example, a Year 10 Theatre unit written and taught by Participant F asked students a great many ‘How’ questions in an attempt to facilitate their exploration of the topic. This unit also encouraged students to self select props and costumes and to problem solve using brainstorming sessions. Finally, a central feature of this unit was that every lesson involved students in performances. (Document Analysis and Classroom Observation recording sheets for Participant F). Participant F also facilitated opportunities for

meeting of like minds (SD8) (Line 71) and developed mentorships for individual students (SD8) (Lines 77 - 82). What is interesting here is Participant F's ongoing commitment to seeking knowledge and information (SD3) (Lines 29 - 36), which seems continually to feed her professional growth and development (Line 43).

Participant G's experiences represent a progressive movement through the stages of development. Firstly, during the interview she spoke clearly about her understanding of the needs of the gifted learner (SD2) and her classroom provision translated this understanding of needs explicitly into an awareness of what needs to be done (SD5) (Document Analysis and Classroom Observation recording sheets for Participant G). She described how she was now "more aware of how to identify" (Line 25) students and also of how to adapt "material to make it more accessible" (Lines 72 & 73). She saw the professional development program as empowering her, providing her not only with the strategies (SD6) but also with the confidence to trial these strategies in a classroom environment. Her classroom provision is characterised by a focus on creative and critical thinking skills. For example, she has successfully incorporated brainstorming strategies into her programs to stimulate student thinking. Having taught the basic premises associated with brainstorming she has modified this process to involve a series of thinker's keys to act as a further springboard for new ideas. (Document Analysis and Classroom Observation recording sheets for Participant G). Her consequent successes in the classroom have encouraged her to provide opportunities for the gifted "to express themselves and discuss with like-minded students" (Lines 117 & 118) (SD8), particularly through her active and long standing involvement in the "Days of Excellence Program" (Document Analysis and Classroom Observation recording sheets for Participant G).

During her interview, Participant H also displayed a sensitivity to gifted learners' needs (SD2). She was motivated to seek strategies (SD6) and her classroom practices demonstrated that she was able to provide successfully for

these students within her classroom (SD7) (Document Analysis and Classroom Observation recording sheets for Participant H). Participant H described the “agitation” (Line 52) and the “frustration” (Line 44) experienced by these students (SD2). She went on to discuss her “attending different workshops and seminars” (Line 10) and how she took techniques from these and “incorporated [them] into my general classroom environment” (Lines 24 & 25) (SD6). During observation of her classes Participant H was successfully implementing such strategies (SD7) as “in and out trays” (Line 29), “which maybe allow [the gifted] to progress at their own rate” (Lines 27 & 28) and she provided a range of extension activities (SD7) which differentiate the learning environment within her classroom (Document Analysis and Classroom Observation recording sheets for Participant H).

Participant I, although at times presenting a stereotypical picture of the gifted (SD1), at other times was clearly sensitive to their needs (SD2). During her interview she spoke of the gifted “[breezing] through school without a lot of difficulty” (Line 15), she spoke of their role in modelling for other students (Lines 74 - 76) and yet she also spoke of their frustration at being forced to work cooperatively with lesser ability students (Line 105). Participant I characterised her involvement in the professional development program by describing her “willingness to get resources” (Line 31); she was therefore keen to seek knowledge and information (SD3). She discussed her application of strategies in the classroom and her program work in providing for the gifted and she explained how she had worked hard to establish a “forum for excellence” (Lines 109 & 110) (SD8) via the school debating program. She saw this opportunity for students of like mind to get together as “invaluable” (Line 110). Her classroom provision was characterised by a focus on critical thinking skills (P11.18). Classroom observations allowed the researcher to witness the general atmosphere that the teacher had created to facilitate the development of students’ critical thinking skills. This atmosphere encouraged students to question, interact and debate the concepts and information being presented. The teacher was able to take on the role of devil’s advocate thus constructively probing and challenging student thinking. Finally, the

atmosphere in the classroom enabled students to present their ideas without fear of peer group recrimination (Class Observation recording sheets for Participant I). Participant I assisted in the development of students' metacognitive skills (P11.19) by challenging them to reflect upon their thinking: "What did you learn during today's lesson?" (Document Analysis recording sheets for Participant I).

Finally, during her interview Participant J spoke of her deepening understanding of the gifted (SD2) (Lines 12 -14 and Lines 21 - 27) and how this had impacted upon her classroom practice (Document Analysis and Classroom Observation recording sheets for Participant J). She seemed aware and sensitive to their needs (SD2) and was basically working at the stage where she was being provided with skills (SD6), and was implementing new strategies in her classroom (SD7). She illustrated this when she said, I have been "involved in setting up, for example using the "multiple intelligences" (Lines 16 & 17) and "looking at Bloom's Taxonomy" (Lines 17 & 18) in the Maths program. She also demonstrated this in practice by developing the creative problem solving skills of her students during a Year 10 Science unit which was based on the Future Problem Solving model (Document Analysis and Classroom Observation recording sheets for Participant J).

### **Question 1b**

This next question asked participants to identify which aspects of the program had been particularly influential in altering their ideas regarding the education of gifted students. Once again these strategies were the basis of the professional development model as implemented by the Experimental School.

Two participants (E and H) spoke of the impact of general seminars and workshops (PD1). Participant E saw these experiences as helping her "to understand individual differences" (Lines 12 -15 & Lines 19 - 21) and Participant H reflected that these experiences had "influenced me very much" (Line 9).

Resource packages (PD2) came in many forms. Generally, however, participants recognised that there was always “plenty of material’ available (Participant F, Line 32). Participant B was particularly inspired by a video and booklet which she felt was “just so true” (Lines 29 & 30).

In a similar way two participants (B and F) responded very positively to the staff awareness displays (PD3) which were set up in various parts of the school during the program. In particular Participant B was able to list the contents of each and to explain how she was able to “relate to those very well” (Line 44).

Mailbox drops (PD4) occurred regularly throughout the program and included general material on issues related to giftedness and specific material related to classroom strategies. Three respondents (B, F and H) confirmed that they had “certainly gained from the mail drops” (Participant H, Line 64) and the information that had come their way. Participant B went on to name particular articles and to refer to the impact they had made upon her (Lines 15 & 16).

Support Teacher generated strategies (PD5) were disseminated in a number of ways. They could be included in seminar and workshop presentation or be part of resource packages, displays or mail box drops. They were certainly part of classroom demonstrations and they were embedded in all forms of curriculum differentiation. Therefore, it is not surprising that this aspect of the program was not specifically commented on by any of the respondents perhaps because it was seen to be embedded within the entire program of professional development as experienced by the Experimental School.

Only one participant (H) suggested that observing classroom demonstrations (PD6) had being particularly influential in altering her ideas about how to provide for the gifted. She spoke of taking “a lot of different little techniques” (Line 23 & 24) and “[incorporating] them into my general classroom environment” (Lines 24 & 25).

Individual consultation to assist with curriculum differentiation (PD7) was listed by three participants (B, D and F) as being particularly influential in altering their ideas regarding the education of gifted students. This component of the program appeared to be valued because it responded directly to personal needs as they occurred. As Participant B expressed it, “There are people that you can liaise with or consult with. I feel a strong sense that that is very effective” (Lines 51 & 52). Participant D and F supported this contention and went on to explain that it was the opportunity to springboard program ideas off these support persons that was so greatly valued (Participant D, Line 29 and Participant F, Line 34).

Informal discussion groups (PD8) occurred during departmental staff meetings and within the staffroom. Four participants (B, D, I and J) listed this aspect of the professional development program as being “very useful” (Lines 50 & 51) in altering their ideas regarding the education of the gifted. The nature of these discussions varied. Participant D spoke of receiving peer feedback on programs that she had co-written and implemented with other members of the department (Lines 46 - 49). Participants I and J both discussed who the gifted were and how best to provide for them (Participant I, Lines 21 - 26 and Participant J, Lines 22-27 and Lines 12 - 14), while Participant B focused on strategy discussions (Line 9).

The aspect of the professional development program most cited as influential was the collegial construction and exchange of resources (PD9). Six participants (A, D, G, H, I and J) spoke of this as being particularly effective. Working with other teachers to generate and team-teach new materials provided an inbuilt support mechanism which nurtured each participant through the challenging process of change. For example, Participant G described the support offered to her by her colleagues in the following way: “I would have been unable to put it together without a Science Teacher (Lines 78 & 79). I was getting a lot of um, knowledge and um, affirmation and confirmation” (Lines 80 & 81). In a similar way, the exchange of resources

between colleagues facilitated a broader application of each strategy. Opportunities were created to mentor other teachers in their trialling of a new strategy, and then informally to provide feedback and support about how to modify or extend the strategy. As Participant H explained, “other staff refer to you and ask how did you use that and how did that work” (Line 98). The next step involves learning from this new application. As described by Participant J, “you can see the slight changes they have made” (Line 50).

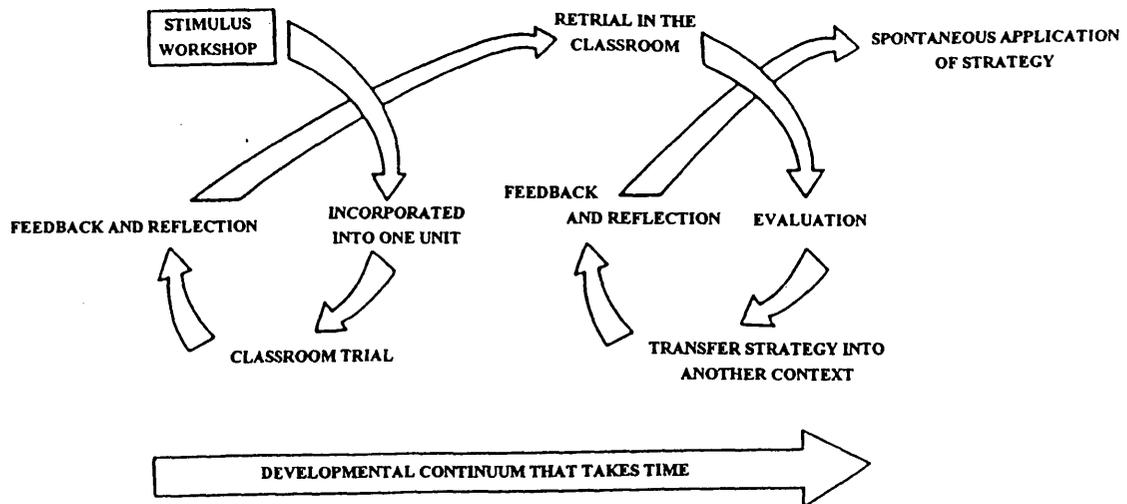
Five of the participants (A, D, E, G and J) are in positions where they are able to formally model strategies for other teachers (PD10). Interestingly, three of these teachers work in support roles and the other two are Heads of Department. By the very nature of their positions they have a capacity to influence what happens in other teachers’ classrooms.

Participant G and J have taken this influence further to share their successes by networking (PD11) with teachers outside of the school. Both have presented their program ideas at local network meetings and at State conference level. Finally, four of the participants (A, F, G and J) were actively involved in a school-based committee (PD13) which aimed to enhance staff understandings about the gifted and gifted education. Therefore, they were instrumental in making change happen for other members of the Experimental School’s teaching staff.

An additional aspect of the participant responses, which is not presented as a distinct component of the professional development model, referred to classroom experiences. Four participants (A, D, E and I) referred to their “involvement in teaching gifted and talented students” (Participant E, Lines 12 & 13) as being particularly influential in altering their ideas regarding the education of gifted students. As Participant A explained: “If there is one experience that sticks in my mind it is the Year 9 Art class which came in to use Coral Draw” (Lines 85 & 86).

Similarly, two participants (A and J) also provided some insights into the process of change as it affects shifts in attitude and practice. Participant J emphasised that change “takes time” (Line 52) and “it is developmental” (Line 51). She also spoke about the element of readiness, recognising that it is very important: “until people are ready, people may not pick it up” (Lines 53 & 54). Participant H expanded these ideas, defining a change process as taking time (Line 66) and needing to build in opportunities for trial and error (Line 67). Her process of critical self reflection and inquiry parallels the features of Kemmis and McTaggart’s (1998) Action Research Spiral, an underlying methodology of the “Making Change Happen” (Queensland Department of Education, 1994) model of professional development implemented by the Experimental School. Figure 5 below, provides a graphic representation of Participant H’s understanding of the process of change.

**Figure 5: Participant H's understanding of the process of change**



### Question 2

An interesting picture of provision was painted by drawing together the data from the participant interviews, the classroom observations and the document analysis.

Participant A utilised a number of different strategies, all of which responded to the unique learning needs of the gifted. Firstly, she reduced the time spent on the basics (P1), omitted those parts of the course that could already be done (P2) and permitted students to speed up if they could work more quickly (P3) (Document Analysis and Classroom Observation recording sheets for Participant A). During her interview she explained this process by saying: “What I tend to do is take the first ten minutes of a lesson showing the basic concepts and the students can then take that concept to where they want” (Lines 95 - 97). “I also no longer expect a child to listen from the first minute to the tenth minute. Um, those students who already know will normally move on themselves” (Lines 94 - 96). This approach was confirmed by the classroom observations undertaken by the researcher (Classroom Observation recording sheets for Participant A). Participant A encouraged her students to be more responsible (P4), “to take charge” (Line 202) of their own learning and this has meant a change to her usual teaching style (P5). She describe this during her interview when she said things like, “you have to be prepared ...” (Line 46) and “a lot more tolerance” (Line 135) is needed. She demonstrated this in her classroom when she set a particularly open-ended task for a group of Year 9 students who were exploring Fractals. This open-endedness encouraged the students to take responsibility for their learning, to extend and explore the task in whichever ways they wanted to (Classroom Observation recording sheets for Participant A). During her interview Participant A went on to illustrate this shift in her teaching paradigm by suggesting that students “only come back to [me] as a reference point now” (Line 147). Overall, her approach was to develop the enabling skills of her students (P11). In particular she used open-ended tasks (Line 177) to develop the independent decision making skills of her students (P11.11). She demonstrated this approach in her Year 8 class when she asked her students to submit the front page of a newspaper. Within the general confines of this task she encouraged her students to respond creatively, accepting responsibility for personal decisions about their products (Document Analysis and Classroom Observation recording sheets for Participant A). She taught her students how to define their problems (Line 167) (P11.16) so that they could apply creative problem solving strategies (Line 170) (P8); she encouraged higher order thinking skills (Lines 177 - 179)

(P11.18) and developed students' metacognitive skills (Line 170) (P11.19). An example of these strategies can be found in one of Participant A's Year 8 lesson plans when she asked students to participate in a mystery challenge (Document Analysis recording sheets for Participant A). In ability groups of three, students were challenged to solve a murder mystery. Clues were posted on an intra-web site and students e-mailed the "Inspector" for clarification or with possible solutions. An electronic metacognitive reflection sheet concluded the activity.

Participant B, on the other hand, saw her role as that of a facilitator, someone who extended the specific interests and understandings of the gifted learner (P7). Her classroom provision demonstrated this when she provided her Year 10 Geography students with the tools they needed to undertake independent research and then gave them a choice of topic and of product (Document Analysis Participant B). During her interview Participant B explained "I look for opportunities, um that are offered" (Line 62). These opportunities involved valuing the uniqueness of the individual student (Lines 64 - 68), and encouraging them to apply their knowledge and understanding to new situations (Lines 76 & 77) (P9). Her lesson planning demonstrated the use of open-ended tasks in an attempt to facilitate these skills (Document Analysis and Classroom Observation recording sheets for Participant B). Participant B aimed to develop the self confidence of her gifted students (Line 65), encouraging them through her questioning technique to address higher order thinking skills (Line 79) (P11.18). She taught her students about the levels of thinking in Bloom's Taxonomy and introduced them to the Q Matrix as a means of developing their thinking skills (Document Analysis and Classroom Observation recording sheets for Participant B).

Participant C longed to develop in her gifted students a passion for learning. "I want to get them excited about it so that they can extend themselves" (Lines 130 & 131). Through her content she aimed to encourage a meaningful examination of social issues (Lines 137 - 139) (P10) and through her

questioning techniques (Line 57) she hoped to encourage higher order thinking skills (P11.18). Her lesson plans focused on providing for deeper thinking skills by asking students to draw conclusions from selected evidence and to justify their responses (Document Analysis recording sheets for Participant C). Classroom observations revealed a similar approach with an emphasis on developing student research skills, selecting evidence and justifying conclusions (Classroom Observation recording sheets for Participant C).

Participant D had a limited approach to providing for the gifted in her classroom. She submitted one Year 8 Independent Research Assignment (P11.3), which was specifically focused on strategies to provide for the gifted in the regular classroom (Document Analysis and Classroom Observation recording sheets for Participant D). This unit provided choice (P4) both in the task students undertook and in the assessment they completed. Students contracted themselves to take on specific tasks and a portfolio of student selected work was submitted for assessment. Therefore, this unit also provided students with the opportunity to specialise (P12) in particular levels of thinking or in particular types of products. Students were taught the levels of Bloom's Taxonomy so that a selection of tasks could be made from a contract based upon a points system linked to the taxonomy. Therefore, the unit focused on thinking skills (P11.18) and there was recognition of individual differences. Finally, students submitted self and peer evaluations as part of the unit's assessment, thereby focusing on metacognitive skills (P11.19). However, this unit was written in consultation with the Resource Teacher and analysis of Participant D's other lesson plans and classroom observational records revealed that there had been no transfer of these strategies into other areas of her teaching. In her interview Participant D explained how she relied upon the content to challenge her gifted students (Line 78).

Participant E saw her main role in providing for the gifted as being a facilitator enhancing their independent learning skills (P11), thereby encouraging and permitting them to be responsible for their own learning (P4). Practically she

achieved this through the implementation of independent work units (Lines 132 & 133) (Document Analysis and Classroom Observation recording sheets for Participant E) which were based upon student choice and variable pacing. “All the prac work [was] integrated into it and you just work through it at your own pace” (Lines 135 & 136). At another level she also responded to incidental opportunities as they occurred. “If someone says, ‘What if...?’ I say well design an experiment for me and test it” (Lines 28 & 29). These challenges also encouraged students to extend their knowledge, understanding, skills and processes to new situations (P7 and P9). Such methods required that Participant E be flexible in her approach, willing to change her usual teaching strategies (P5) and “go off on tangents” (Line 101) when they presented themselves. Participant E’s focus on enhancing skills had students investigating and researching (P11.1), by collecting their own data (Line 74). She encouraged students to facilitate each other’s understanding of problems (Lines 53 & 54), utilising social roles (P11.5) in cooperative learning situations (P11.6). For example, Participant E asked her Year 11 Chemistry students to work collaboratively to analyse graphically displayed data. Using a process called ‘Jigsaw’, students had to create their own graphs within small ‘Home’ groups and then join ‘Expert’ groups to look for patterns and trends across the various graphs, before returning to their ‘Home’ groups to debrief and discuss their findings (Document Analysis recording sheets for Participant E). She focused on deeper thinking (P6) through an emphasis on process skills (Line ) and metacognitive skills (P11.19) through inter-group debates (Lines 86 & 87), where students explained their thinking and justified their predictions (Document Analysis and Classroom Observation recording sheets for Participant B). Overall Participant E utilised a number of different strategies, all of which responded to the unique learning needs of the gifted.

Participant F provided for gifted students in her classes in three main ways. Firstly, she encouraged and permitted students to extend their knowledge, understanding, skills and processes (P7) by providing them with opportunities to apply these to new situations (P9) (Document Analysis and Classroom Observation recording sheets for Participant F). She altered the texts (Line 47)

that students were working from and varied tasks (Lines 55 - 58) to increase their complexity (P11.18). Secondly, she extends students' specific interests and understandings (P12), by individualising tasks. "This could be a really good angle for you to follow because you are interested in that aspect ..." (Lines 68 & 70). In a similar way Participant F brought in outside agents (Line 78) to extend her students, recognising that she had "taken them as far as I feel I can with this" (Lines 78 & 79). Finally, Participant F aimed to encourage her students to be more responsible for their learning (P4) and facilitated this through the development of their enabling and performance skills (P11). One way in which she achieved this was through choice, choice in tasks and choice of text (P11.11). For example, in her Year 11 Drama unit on Realism, Participant F challenged her students to create new products after providing scaffolding and modelling through teacher led mini-lessons (Document Analysis recording sheets for Participant F). Similarly she asked her students, "How would you like to tackle this?" (Line 68). Group work (P11.5 & P11.6) was a major component of Participant F's classes and again choice was important in forming these groups. During her interview she observed how "Within the group like minds have somehow formed together" (Line 71). As a consequence of their participation in her classes students have demonstrated their motivation (P11.14) and self-confidence (P11.12) by specialising (P11.2). "Quite a few of the kids are joining 'La Boite' and the theatre school there" (Lines 86 & 87) while others have "started doing TAFE courses" (Line 90), in lighting for example.

Participant G's main provisions for the gifted focused on thinking (P6) and cooperative learning (P11.5, P11.6 and P11.7) skills, within a context of independence in student decision making (P11.11) and responsibility for their own learning (P11.13). She was interested in extending student understandings of the processes of critical and creative thinking (P11.18), including metacognitive reflection (P11.19) within a futures orientation (Document Analysis recording sheets for Participant G), thereby encouraging a meaningful examination of social issues and conflict situations (P9) (Document Analysis recording sheets for Participant G). Once again the issue of choice was seen as

an important one (P4, P11.13, and P11.11). Students were given choices “in which tasks and in which products” (Lines 47 & 48) they undertook (Document Analysis and Classroom Observation recording sheets for Participant G). Many of the strategies mentioned by Participant G refer to specific activities run as part of the ‘Days of Excellence’ program. It was, however, interesting to see how she was able to transfer some of these strategies into her general classroom practice. For example, she demonstrated this transfer when she used the ‘What is it? and What is it used for?’ (P8, P9 and P11.17) strategy to stimulate creative thinking in response to a set English task (Classroom Observation recording sheets for Participant G). In another instance, she explained how she pre-tested students (Line 177), thereby omitting those parts of the course that students could already do (P2) (Document Analysis recording sheets for Participant G). In yet another unit she spoke of teaching “the whole idea of Bloom’s Taxonomy to students” (Line 178) (P6 and P11.18). This enabled them to understand the basis of a unit that gave them choices about tasks based on the taxonomy. As Participant G explained, students “realised whether they could think at a certain level” (Line 181) and by preteaching the taxonomy students “identified their area of strength or difficulty” (Line 182) (P11.11, P11.12 and P11.13).

Participant H provided for the gifted learners in her classes by allowing her students to vary the pacing of activities (P3), thus reducing the time they spent on the basics (P1) and making them more responsible for their own learning (P4) (Classroom Observation recording sheets for Participant H). This was achieved through the introduction of “basic physical things like in and out trays” (Line 29). At another level Participant H strove to engage her students in Higher Order Thinking (P11.18) through the use of Bloom’s Taxonomy (Line 71) (Document Analysis and Classroom Observation recording sheets for Participant H). Participant H believed that by understanding the Taxonomy students could intelligently choose their own levels to work at. This strategy became part of both an English unit and a Foreign Language unit co-written (SD7) and taught by Participant H (Document Analysis recording sheets for Participant H). Similarly, she challenged student thinking in a Year 11 Poetry

unit through the use of the de Bono Thinking Hats strategy (P6, P11.17, P11.18 and P11.19) (Document Analysis recording sheets for Participant H). The English Department valued this approach to the extent that it has now become part of the assessment for this unit of study. For example, “students, under exam conditions, [will be] presented with an unseen poem and [will be] asked to discuss the poem using two nominated hats” (Lines 105 -106). To deepening student thinking (P6) Participant H taught students to decode questions because she believed that it was “a tremendously freeing experience” (Line 41). She recognised that some gifted students were unable to show their knowledge “simply because they lacked the skills of decoding questions” (Lines 38 & 39). Finally, Participant H used “gifted students in specific roles in small collaborative work” (Lines 7 & 8) to develop their social roles (P11.5) and enhance their cooperative learning (P11.6) skills (Document Analysis and Classroom Observation recording sheets for Participant H).

Participant I’s provision for the gifted involved both in-class and extra-curricular activities. Within the classroom Participant I offered her students the opportunity to undertake independent projects and developed their thinking through her questioning style. For example, during her Year 9 History class she presented a political cartoon for analysis and followed this with a series of open-ended and probing questions aimed at developing students’ thinking skills. Firstly, she asked students to consider the message of the cartoon: “What do you think the cartoonist had in mind?” She followed this with a challenge for her students to justify their responses: “Why do you think that?” Next, she asked them to place the cartoon within a context and to consider the implications of the economic conditions of the times. Finally, she asked her students to reflect upon how they had reached their conclusions remembering to link the process to evidence presented within the cartoon itself. (Classroom Observation recording sheets for Participant I). The independent projects were group based to extend students’ cooperative learning skills (P11.6). Students “found their own materials and did their own research” (Lines 80 & 81) in an attempt to expand their ability to make decisions independently (P11.3 and P11.11). Students then presented their findings to other members of the class,

enhancing their performance skills (P11.10) and developing their confidence (P11.12). Similarly, Participant I's questioning style was "more focused on developing process skills" (Line 36) and in that respect she felt she was "challenging the thinking of [her] students" (Line 38). She described her questions as "more probing, pitched at higher level thinking and more open-ended" (Lines 52 & 53) and this was confirmed by the classroom observations undertaken as part of this research (Classroom Observations for Participant I). As Participant I described it, her questioning style (P11.18) aimed to develop students' abilities "to think of all corners on a particular issue" (Lines 55 & 56), "to make them think beyond the content level" (Lines 38 & 39).

Participant I also took on the role of devil's advocate to extend student thinking and was impressed at situations "where students [had] given quite solid reasoning for an oppositional opinion" (Lines 46 & 47). Beyond the classroom Participant I facilitated two very valuable extra-curricular activities which aimed to encourage students to engage in meaningful examinations of social issues and conflict situations (P10 and P11.7), to provide for deeper thinking skills (P6) and to enhance performance skills (P11.10). The Current Affairs Tutorials (P10) allowed students to run with a passion (Line 95), extending specific interests and understandings (P12) while providing them with a forum for developing their higher order thinking skills (P11.18) (Lines 49 - 51). Similarly, the debating program (Line 99) at the school was seen by Participant I as providing a "forum for independent thinking" (Lines 101 & 102) (P11.11), allowing students to be more responsible for their own learning (P4) and develop their performance skills (P11.10). Such a "forum for excellence" (Line 108) was described by Participant I as being "invaluable" (Line 110).

Finally, Participant J utilised several strategies to provide for the gifted student within her classes. Firstly, she spoke of a "Year 10 science unit which uses Parnes's Problem Solving model - the six step process" (Lines 59 & 60) to develop the creative problem solving skills of her students (P8). Within this unit students "generated a problem" (Line 77) (P11.16) and then "they had to come up with solutions" (Line 79) (P8) (Document Analysis recording sheets for Participant J). Participant J also spoke of allowing her students to be more

responsible for their own learning (P4), explaining how she used contracts (Line 64) to provide students with choices about the level of difficulty involved in the tasks they undertook (Lines 69 & 70). She also described how they could “create their own path” (Line 71) through a unit of work. Finally, improving the enabling skills of her students was another strategy used by Participant J to provide for the gifted learner within her classes. One project involved students creating their own maths web site (Line 134). This project involved internet research (P11.3), surveying potential clients to gauge potential usage and possible content (P11.1) and construction of the site (P11.18). In another example Participant J explained how students “found their own stimulus and then applied [Bloom’s] Taxonomy” (Line 88) (P11.18 and P11.11). Finally, Participant J described how she used pre-testing (Lines 99 - 113) to omit those parts of the maths course that students could already do (P2) allowing them to reduce the time they spent on the basics (P1) and permitting them to speed up if they could work more quickly (P3) (Classroom Observation recording sheets for Participant J).

## Chapter 6 Discussion and Conclusions

The present study investigated the hypothesis that involvement in the professional development program run by the Experimental School and based on the model “Making Change Happen” (Queensland Department of Education, 1994) would change positively teacher attitudes toward giftedness and the appropriate educational provision for gifted students.

This study analysed issues associated with how to measure teacher attitudes toward the gifted, what contributes to positive changes in these attitudes, and the relationship between attitudes and practice. Therefore, the research methodology utilised by this study was designed to observe and measure the intensity and direction of shifts in attitude towards gifted students among teachers employed in a school that provided access to a series of support strategies aimed at providing for their particular stage of development, and to investigate the “crystallising experiences” (Gross, 1994) which participants believe had contributed to their attitudinal changes.

The purpose of this chapter is to present the major findings from this study, and to highlight conclusions and implications from these findings. However, it should be emphasised that this study does not aim to produce widely generalisable findings. The researcher recognises that the context of the study is specific. Therefore, the objective of this study is to increase general awareness and understanding by highlighting a specific situation, in a specific setting.

### 6.1 Major Findings

A. Both the quantitative and qualitative data gathered by this study have demonstrated that positive changes in teacher attitudes to gifted students can be effected through carefully planned and well-conducted professional

development programs and that these changes do impact positively upon facilitating appropriate educational provision for gifted students within a school setting.

B. Analysis of the quantitative data enabled the researcher to further validate the Gagné and Nadeau (1991) questionnaire, “Opinions about the gifted and their education”, as a useful tool for informing professional development associated with the gifted and gifted education.

C. Qualitative data gathered by this study have provided the researcher with a clearer understanding of the aspects of the professional development model which participants believe contributed to shifts in their attitude. These results have validated the basis of the “Making Change Happen” model of professional development (Queensland Department of Education, 1994) but have also suggested some modifications to this model.

## 6.2 General Discussion

**A. Positive changes in teacher attitudes toward gifted students can be effected.**

As demonstrated by the quantitative data, post-test results for the Experimental School clearly exceeded those of the Control School. This suggests that the intervention undertaken by the Experimental School was in fact successful in changing positively teacher attitudes toward the gifted and appropriate educational provision for these students. It must however, also be acknowledged that the staff at the Experimental School began this study with more favourable attitudes toward giftedness and appropriate educational provision for gifted students as measured at the time of pre-testing. It is interesting, therefore, to note that pre-test profiles for both the Experimental School and the Control School generally presented as similar across each of the Factors (awareness of the needs of the gifted, lack of

objection to special services, belief in the social usefulness of gifted persons, rejection of gifted persons by others in the immediate environment and attitudes toward ability grouping and acceleration). On the other hand post-test profiles for Factors A, D, and F reflected a downward shift for the Control School coupled with a sustained or slightly increased result for the Experimental School, while both schools reflected a similar shift in attitude for Factors B, C and E.

An examination of the individual factors provides a detailed understanding of these shifts in attitude as measured by the Gagné and Nadeau (1991) questionnaire, "Opinions about the gifted and their education".

#### **Factor A**

Both groups began the study with a positive attitude to recognising the needs of the gifted. Post-test results suggested that while the Experimental School remained positive toward this issue staff at the Control School showed an overall downward shift in their attitude toward recognising the needs of the gifted.

#### **Factor B**

Both groups began the study with a relatively positive attitude to offering special services to provide for the gifted. These results were reversed however in the post-test measure, with both schools recording an overall downward shift to an ambivalent attitude toward this issue. This downward shift in attitude, as reflected by post-test results, could be linked to the general negative community perspectives toward the gifted as presented to the 1988 Senate Select Committee (1988:104).

#### **Factor C**

At the commencement of the study both schools presented as having positive attitudes toward the social usefulness of gifted persons, with the Control School actually having a more positive attitude than the Experimental School. The percentage of positive attitudes recorded by the Experimental School staff reflected a slight increase on post-test results, while results for the Control

School show a strong positive shift in attitude toward the social usefulness of gifted persons. These results suggest that participants recognise the value of the gifted, but this recognition appears to be juxtaposed with an ignorance (Fetterman, 1988) in relation to special needs and appropriate provision as reflected by the results for some of the other factors.

#### **Factor D**

Both schools began this study with a clearly divided attitude toward the possible rejection of gifted persons by others in the immediate environment. These results may be seen to reflect a general pattern of community attitudes toward the gifted (see Senate Select Committee, 1988; Gross, 1993; Leder, 1985). By the conclusion of the study results for the Experimental School demonstrated a strong shift toward the positive end of the distribution while results for the Control School clustered now around the ambivalent and negative end of the distribution.

#### **Factor E**

Pre-test results for the Control School concur with the findings of Gross (1994 & 1997), Goldberg (1981), the Senate Select Committee (1988) and the Australian Association for the Education of the Gifted and Talented (1998), who suggest that educators frequently voice concerns regarding the differentiation of curriculum through the use of ability grouping. The Control School began this study with a strong negative attitude toward the ability grouping of gifted students. On the other hand the Experimental School began the study with a more ambivalent attitude toward this issue. Post-test results demonstrated a shift in the positive direction for both the Control School and the Experimental School but with an increased percentage for the Experimental School.

#### **Factor F**

In a similar way both the Experimental School and the Control School began this study with an ambivalent attitude toward the acceleration of gifted students, though the Control School demonstrated a slightly more negative attitude towards this issue than the Experimental School. Once again these

results concur with the findings of Gross (1994 & 1997), Goldberg (1981), the Senate Select Committee (1988) and the Australian Association for the Education of the Gifted and Talented (1998) who found that educators frequently voice concerns regarding the differentiation of curriculum through the use of acceleration strategies. However, by the conclusion of this study the attitudes of the Experimental School recorded a clear shift in the positive direction while the attitudes of the Control School demonstrated a clear shift in the negative direction.

It is not surprising that the changes in attitude as reflected by the post-test results for the individual Factors for the Experimental School were somewhat small. As these staff began the study holding relatively positive attitudes their post-test results may reflect a type of ceiling effect. However, it is also interesting to note the downward shift in attitude experienced by the Control School, which suggests that without focused professional development activities attitudes toward the gifted and toward appropriate educational provision for the gifted fall back into a more stereotypical image.

**B. Carefully planned and well-conducted professional development programs are the key to changing positively teacher attitudes toward the gifted and toward gifted education.**

This study has demonstrated that good quality professional development is a critical factor in changing the negative attitudes of teachers toward the gifted and toward gifted education. These results correspond with the findings of Whitlock and Dactle (1989), Davis and Rimm (1994), and Gross (1994).

Course participants defined good quality professional development as:

- *Emphasising the principles of effective learning* (The Queensland Department of Education, 1990).

Qualitative data from the Experimental School illustrated respondents' recognition of the focus of the professional development activities on solutions to real problems. In particular the five steps of the Creative Problem Solving Process (in Dalton, 1985) which formed the basis of the professional

development model used by the Experimental School were clearly identified by several of the participants. Participant H described her experiences of the professional development process undertaken by the Experimental School (see Figure 5, p105) as taking time (Line 66), and facilitating opportunities for trial and error (Line 67) and critical self reflection and inquiry. These ideas echo the fact finding, problem finding, idea finding, solution finding and acceptance finding stages of the model.

Qualitative responses also highlighted the value of the collaborative interaction which was generated between participants (Participants A, D, G, H, I and J). This was a particular feature of the professional development model implemented by the Experimental School (Hill & Eckert in Queensland Department of Education, 1994).

Results went on to demonstrate that there was a direct correlation between support strategies mentioned by participants and those listed as part of the professional development model, “Making Change Happen” (Queensland Department of Education, 1994). For example, participants listed general seminars and workshops, resources packages, staff awareness displays, mail box drops, support teacher generated strategies, classroom demonstrations, individual consultation to assist with curriculum differentiation, informal discussion groups, the collegial construction and exchange of resources, modeling, networking, and involvement in committees as being particularly influential in altering their ideas regarding the education of gifted students. Different respondents however, highlighted different strategies as being particularly influential. The researcher believes that these differences reflect the model’s perspective that educators are at very different levels of awareness. For example, participants spoke of the professional development program reinforcing ideas already held (Participant E, Line 8; Participant J, Lines 21 & 22), challenging thinking (Participant F, Line 13) and focusing ideas into action (Participant I, Lines 8 - 11; Participant H, Line 8). Consequently, a series of strategies, pitched appropriately, is needed to move individual teachers through this continuum of development.

Findings from this study also help us to understand the awareness perspective of the model, “Making Change Happen” (Queensland Department of Education, 1994). What is particularly interesting to note is that participants could be operating at many different levels of the model at any one time. Due to the complex nature of the issue under consideration this was not surprising. Understanding gifted students and appreciating how best to provide for their learning needs is multifaceted, therefore it was easy to understand, for example, how someone could be working at one level in terms of definition and another in terms of provision. Participant I, although at times presenting a stereotypical picture of the gifted (Lines 14 & 15 and 74 - 76), at other times was clearly sensitive to their needs (Lines 17 and 104 - 106) and provided appropriately for them through both in-class and extra-curricular activities (P4, P6, P11.3, P11.6, P11.7, P11.10, P11.12, P11.13, P11.18 and P12) (Document Analysis and Classroom Observation recording sheets for Participant I).

- *Being of substance, having credibility and worth* (The Queensland Department of Education, 1990; The Queensland Board of Teacher Registration, 1991; Gross, 1994; Queensland Department of Education, 1994).

The results of this study help us to understand that substance, credibility and worth mean different things to different people. Whereas participants in Gross’ study (1994) identified credibility of content as one of the most important aspect of their professional development program, participants in this study seemed to consider that the worth of the program lay in its ability to facilitate change. Gross’ study (1994) identified academic rigour, empirical research and international leaders as being particularly influential in changing participants’ attitudes toward the gifted and toward gifted education. On the other hand, participants in this study identified the flexibility of the program’s provision, the informal “sideways filter of information” (Participant F, Lines 18 & 19) and the ability of the program to respond to participants’ readiness levels as being particularly influential in changing participants’ attitudes toward the gifted and toward gifted education. Qualitative responses reflected

the value participants placed on material being available on a “needs to know basis” (Participant F, Line 22). The issue of readiness was illustrated by Participant J who explained that “until people are ready, people may not pick it [ideas, strategies] up” (Lines 53 & 54). In a similar way Participant F went on to speak of the “sideways filter of information” (Lines 18 & 19), which came to people in an “informal way” (Line 20) as part of the Experimental School’s model of professional development. Participant J emphasised that change “takes time” (Line 52) and that “it is developmental” (Line 51). Participant H expanded on these ideas, suggesting that the process of change not only takes time (Line 66) but must allow opportunities for trial and error (Line 67) and critical self reflection and inquiry (see Figure 5, p105). In these ways, results from this study parallel the work of Holliday (1992) who found that effective teacher learning cannot be forced and is an active process that needs to develop as an integral part of their working lives.

- *Resulting in empowerment* (Gross, 1994).

Clearly, respondents valued the sense of empowerment which came from their involvement in the professional development program. Results from Gross’ study concur with these findings. However, while the source of empowerment for Gross’ participants came from their exposure to current research findings and interaction with a large group of teachers with similar attitudes and interests (Gross, 1994:20) empowerment for participants from this study came from their confidence to process information, trial programs and self evaluate their successes in a supportive environment and at their own pace.

**C. “Crystallising experiences” (Gross, 1994) enhance the model of development, “Making Change Happen” (Queensland Department of Education, 1994).**

The collation and analysis of the ‘crystallising experiences’ (Gross, 1994) that participants believed contributed to their attitude change generated a detailed list of explicit examples. These examples while reflecting the support

strategies presented as part of “Making Change Happen” (Queensland Department of Education, 1994) model also provided information about additional strategies that could be incorporated into a future professional development model.

As indicated earlier, research findings suggest that involvement in teaching gifted students is a critical factor in changing positively the attitudes of teachers (McBride, 1988; Senate Select Committee, 1988; Korynta, 1982; Davis & Rimm, 1994). When asked to reflect upon which aspects of the program had been particularly influential in altering their ideas regarding the education of gifted students this factor was directly referred to by four of the participants (A, D, E and I). These results suggest that the professional development model, “Making Change Happen” (Queensland Department of Education, 1994) needs to incorporate formally this specific strategy for moving participants along the continuum of development.

Linked to this factor qualitative data from this study suggest that teachers value their involvement in writing and running programs specifically designed for gifted students. The researcher also values this strategy, as it fulfils an important professional development role and thus moves teachers along the continuum of their development. This particular strategy has several advantages which are recognised by Westberg and Archambault (1997) as impacting upon successful differentiation to classroom practices. Firstly, this strategy satisfies a teacher’s need to feel autonomy yet support while implementing new practices. Teacher involvement in writing and running programs specifically designed for gifted students actualises the idea of comfortable experimentation and facilitates risk taking in a supportive environment. Secondly, it often involves working as a team which facilitates the structured level of collaboration as outlined by Hill and Eckert (in Queensland Department of Education, 1994:18). As indicated earlier, teachers valued the opportunity to work collaboratively and hence Participants A, D, G, H, I and J all indicated that the most influential experience of the professional development program was the collegial construction and exchange of resources. Therefore, the researcher would suggest the formal recognition of

this strategy within the model as fulfilling a valuable role in facilitating a change in teacher practice.

**D. Changes in teacher attitudes toward the gifted and gifted education do impact positively upon classroom practice.**

Generally, qualitative results from this study support the findings of Hansen and Feldhusen (1994) who reported that specialist education leads to an improvement in teaching skill and classroom climate. This link between education opportunities for teachers and effective gifted programs was also reported by Orenstein (1984) and McBride (1988).

The results of this study, however, provide insight into how this link works. An important component of the professional development model implemented by the Experimental School involved providing information and support for staff that was appropriate to their specific level of awareness (see Chapter 3.3). In this way the model recognises that 'educational activities' need to be:

- differentiated to address individual needs
- self paced
- flexible enough to allow for choice
- facilitative of risk taking
- challenging.

This research project demonstrated how professional development activities undertaken by the Experimental School were able to engage participants and assist in maturing their stage of development in relation to their understanding of giftedness and the educational provisions for the gifted.

In particular, the qualitative data from this project led the researcher to a better understanding of the paradigm shift necessary for teachers in a differentiated classroom (Tomlinson in Westberg & Archambault, 1997:49). In this paradigm teachers are not dispensers of knowledge but organisers of learning

opportunities. One participant, involved in Phase 2 of this study, was particularly cognisant of this journey and reflected upon it during her interview. Participant A recognised that there had been a change to her usual teaching style. Her approach was now characterised by flexibility and divergence (Document Analysis and Classroom Observation recording sheets). She explained how this journey could be difficult for a lot of people because it was so confronting (Participant A, Lines 51 & 52). She spoke of the need for preparedness and tolerance (Participant A, Lines 46 & 135) as qualities to assist in making this journey.

Many of the participants involved in Phase 2 of this study had successfully made this transition, however some were still grappling with the practical realities of this paradigm shift. For those teachers working out of this new paradigm, providing for the gifted learner meant looking for opportunities to:

- open up tasks to encourage and permit students to take responsibility for their own learning
- extend the complexity of tasks
- create multiple pathways to ensure flexibility and choice
- provide students with the skills needed to work independently
- develop their creative and critical thinking skills.

For those teachers who were still struggling with the transition, an investigation of the qualitative data provided a clearer picture as to what was happening for the gifted in their classrooms. For example, data gathered on Participant C's provision for the gifted demonstrated that she still used a lock-step approach to her teaching. Everyone needed to do the same thing at the same time before moving on to the next thing. Participant C equated this with fairness (Lines 49 & 50). There was little flexibility and no differentiation for the individual. This resulted in a strong sense of frustration for Participant C who was aware of the needs of the gifted but could not see how to respond to these in a mixed ability classroom. In a similar way Participant D relied upon the content of her subject matter to challenge her students (Line 78).

On the other hand, the qualitative data provides excellent examples of teachers transferring strategies from professional development activities into their mainstream classes. These results parallel the findings of Westberg and Archambault (1997:47) who found that “teachers applied what they learned through various professional development opportunities to increase their repertoire of teaching strategies” (1997:47). Why then has this transition not been facilitated for all teachers? The results of this study suggest that a key factor to answering this question lies in the intrinsic motivation of participants to seek information and strategies as a way of feeding their continued professional growth. This factor was also identified by Westberg and Archambault (1997). They reported that differentiated instruction occurs when teachers feel comfortable experimenting with new techniques, strategies and materials and were willing to spend time and effort making these changes to their existing practices occur. Three of the participants particularly identified this factor as relevant to their change processes (Participant E, Lines 62 & 63; Participant F, Lines 29 - 36 7 43; Participant I, Line 31).

**E. As a tool for informing action “Opinions about the gifted and their education” (Gagné & Nadeau, 1991) is very useful because of its ability to profile staff attitudes.**

Results from this study suggested that the Gagné and Nadeau (1991) questionnaire, “Opinions about the gifted and their education”, proved a useful tool in profiling teacher attitudes toward the gifted and gifted education. This profiling acted to inform the professional development undertaken by the Experimental School and as such provided a practical mechanism for establishing teacher levels of awareness before undertaking to implement the supportive strategies perspective of the model (Queensland Department of Education, 1994).

Overall, pre-testing data demonstrated that staff at the Experimental School began the study with favourable attitudes toward giftedness and appropriate educational provision for gifted students. However, by profiling each of the

key factors in turn a more detailed picture of staff attitudes became apparent. For example, staff at the Experimental School began the study believing in the social usefulness of gifted persons. They also demonstrated a high level of awareness of the specific learning needs of the gifted and they recognised the need to provide special services in response to these needs (see Graphs 8, 4 and 6). However, they were clearly ambivalent in their attitudes toward the strategies of ability grouping and acceleration (see Graphs 12 and 14). This information provided a clear pathway for future professional development at the Experimental School. There was an obvious need for the staff to be exposed to the strategies of differentiation. They needed practical methods of providing for the gifted learners in their mixed ability classes.

However, “Opinions about the gifted and their education” (Gagné & Nadeau, 1991) also proved to be a tool with limitations. In building Rasch models for the pre and post-test data for the Experimental School and Control School separately for each factor (ie A to F) the researcher found that there was an acceptable fit between data and model for Factors A to C but not for Factors D to F. For this reason, all of the pre-test data needed to be put into one set and all of the post-test data in another. The researcher was then able to find an acceptable fit between data and model. However, this suggests that the tool’s ability to measure specific sub-factors of attitudes toward the gifted and toward issues associated with gifted education may be limited.

### 6.3 Implications for Practice

The professional development model, “Making Change Happen” (Queensland Department of Education, 1994) has had a positive impact on participants’ attitudes towards the gifted and gifted education as measured by this study. Among the strengths of the program, as viewed by the teachers who participated, are the problem solving perspective from which the model functions, the interconnection of the awareness perspective and the supportive strategies perspective, and the feeling of empowerment gained through the collaborative planning perspective of the model. Therefore, the success of the

model has clear implications for future practice both at the Experimental School and at a general level to facilitate professional development.

At a specific level, the basis of the Experimental School's professional development program will continue to be "Making Change Happen" (Queensland Department of Education, 1994). However, future variations to the model will reflect the findings of this research project. For example, results from this study suggested the value of teacher involvement in writing and running programs specifically designed for gifted students. Therefore, the Experimental School will give priority to creating opportunities for teachers to work within collaborative teams of mixed ability (i.e. different levels of awareness and skill development) in the creation and implementation of specialist activities aimed at providing for gifted students such as Days of Excellence, Tournament of Minds, and the various Cluster activities in which the school is involved. Another example of future variations to the model lies in formalising the collegial construction of resources. Teachers at the Experimental School will be given the opportunity to work with skilled colleagues to devise a range of activities for regular classroom programs that reflect the principles of provision for gifted students. For example, activities that facilitate the development of metacognitive and higher level thinking skills, or activities that facilitate independent decision making and problem solving skills. This collegial construction of resources provides teachers with a supportive framework that can assist them as they work to change their teaching paradigm.

At a general level of application the model "Making Change Happen" (Queensland Department of Education, 1994) has much to offer leaders of professional development programs because of its proven effectiveness. A model such as this, which combines a problem solving perspective, an awareness perspective, a supportive strategies perspective and a collaborative planning perspective, clearly actualises the principles of effective teaching and learning valued by participants. "Making Change Happen" offers leaders of

professional development programs a model which is recognised as being of substance, having both credibility and worth. This model of professional development clearly has the ability to respond to participants' readiness levels with flexibility and informality, qualities valued highly by participants of this study. Results from this study also suggest that "Making Change Happen" empowers participants as they work through the process of change. The researcher believes that these aspects of the model make it an effective theoretical framework for the development of professional development programs.

As has already been discussed, the Gagné and Nadeau questionnaire (1991) also offers leaders of professional development associated with issues of giftedness and gifted education a tool for profiling participants' attitudes with a view to informing future action. "Opinions about the gifted and their education" (Gagné & Nadeau, 1991) can provide a practical mechanism for identifying general attitudes toward giftedness and toward appropriate educational provision for gifted students. Then, by profiling each of the key factors in turn, a more detailed picture of attitudes can be established. This type of information provides an excellent starting point for planning future professional development programs (Wood & Leadbeater, 1986 in Moon, 1996). Leaders of professional development programs can also use this questionnaire as an evaluative tool to measure the effectiveness of professional development undertaken in a particular setting. By using the questionnaire to establish a pre-test and a post-test measurement, leaders of professional development can establish the impact of any intervening professional development undertaken by the participants.

#### 6.4 Recommendations for Future Research

While the present study has identified several useful insights there is scope for further research to build upon its exploratory analysis.

### **1. Shortcomings in the methodology of the present study**

Because the researcher gave an undertaking of confidentiality which prevented the coding of sheets to allow for matching specific pre- and post-test results for individual participants, the present study was unable to detect shifts in attitude of individual participants. Similarly, the researcher was unable to specifically identify pre- and post-test results for Phase 2 participants. Such a comparison would have allowed the researcher to draw a direct link between the quantitative and the qualitative data, an aspect worth exploring in future research into this area.

### **2. Situational constraints imposed by the present study**

The size of the subject sample for the present study limited the statistical analysis which the researcher was able to undertake with the quantitative data. If the subject sample had been increased to 170 (total number of items on questionnaire multiplied by 5) the researcher would have been able to undertake some form of multi-variate factor analysis and therefore be able to co-vary out different factors when analysing results.

The size of the research team, which was linked to the size of the stratified sample, also limited a fuller investigation of actual practice. To increase the size of the stratified sample (Phase 2 of the present study) would have resulted in more extensive document analysis and direct observation of participants which could have provided a clearer picture of actual practice.

Finally, the natural setting in which this study was undertaken meant that the researcher was not able to control all extraneous variables. Even though the Control School was matched to the Experimental School on a number of these variables, the quantitative data suggest that the Experimental School had more favourable attitudes toward giftedness and appropriate educational provision for gifted students at the time of pre-testing. Therefore, an attempt should be made to use more strictly comparable groups in any future investigation of the "Making Change Happen" (Queensland Department of Education, 1994) model of professional development.

### **3. Questions the present study leaves unanswered**

Quantitative data from the Control School suggest that attitudes toward the gifted and toward gifted education may have a tendency to shift downwards along the continuum. This downwards shift in attitude suggests that without focused professional development activities attitudes toward the gifted and toward appropriate educational provision for the gifted fall back into a more stereotypical image. The researcher believes that further investigation of this issue is justified.

In building Rasch models for the pre- and post-test data for the Experimental School and Control School separately for each factor (ie A to F) the researcher found that there was an acceptable fit between data and model for Factors A to C but not for Factors D to F. This would suggest that further investigation of the structure of the questionnaire, “Opinions about the gifted and their education” (Gagné & Nadeau, 1991) would be warranted.

### **4. Extending the present study**

Future research should consider extending into the Control School the Phase 2 component of the present study. This would mean gathering qualitative data (interview, observation and document analysis) from a stratified sample of staff at the Control School. These data would provide a clearer understanding of the link between the attitudes and practice of members of the Control School.

Useful findings have resulted from the current study and they warrant further investigation on a larger scale. Therefore, future research should also consider extending the present study into a number of different schools. Such a study would enable more detailed data to be gathered about “crystallising experiences” (Gross, 1994), the link between attitude and practice and the impact of the professional development model “Making Change Happen” (Queensland Department of Education, 1994).

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