Diagnosing potential: preservice teachers’ understanding and expectations of students with learning disabilities

Stuart Woodcock
University of Wollongong


This paper is posted at Research Online.
NOTE

This online version of the thesis may have different page formatting and pagination from the paper copy held in the University of Wollongong Library.

UNIVERSITY OF WOLLONGONG

COPYRIGHT WARNING

You may print or download ONE copy of this document for the purpose of your own research or study. The University does not authorise you to copy, communicate or otherwise make available electronically to any other person any copyright material contained on this site. You are reminded of the following:

Copyright owners are entitled to take legal action against persons who infringe their copyright. A reproduction of material that is protected by copyright may be a copyright infringement. A court may impose penalties and award damages in relation to offences and infringements relating to copyright material. Higher penalties may apply, and higher damages may be awarded, for offences and infringements involving the conversion of material into digital or electronic form.
Diagnosing Potential: Preservice Teachers’ Understanding and Expectations of Students with Learning Disabilities
Diagnosing Potential: Preservice Teachers’ Understanding and Expectations of Students with Learning Disabilities

Stuart Woodcock, B.A. (hons), QTS. Bton, M.Ed. (Special Education) UOW.

Volume I

A thesis submitted for the degree of
Doctor of Philosophy
University of Wollongong

Faculty of Education

June 2008
STATEMENT OF ORIGINALITY

This thesis reports the original work of the author, except as stated.
It has not been previously submitted for a degree at this or any other university.

Stuart Woodcock
June 2008
ACKNOWLEDGMENTS

I wish to acknowledge, with deep appreciation, Associate Professor Wilma Vialle, principal supervisor, University of Wollongong and Associate Professor Deslea Konza, associate supervisor, Edith Cowan University, for their valuable encouragement and guidance throughout my doctoral studies. Wilma and Deslea willingly offered support and critique at all stages of the doctorate. Their faith in me and this research shall never be forgotten.

Sincere thanks also to Russell Kay for the many precious hours that he spent guiding and critically supporting me with statistical support, analysing of the data and writing up of the methodology and results. There are no words that can express to him my gratitude and appreciation.

I am also grateful to the academic staff, and students, at the University of Wollongong, Charles Sturt University, and Macquarie University who were involved in or supported this study. Without their assistance, the research presented would not have been possible.

I wish to express appreciation to Beverley Lambert for the profuse hours that she spent proof-reading this thesis. I am most grateful for the support and comments I received. Thank you.

My indebtedness to my parents and immediate family, Violet and Wilton Howes, Sue Wilson, and dear friends who supported me in so many ways throughout my doctoral studies can never be erased. Without their love and assistance I would never have managed to reach this stage.

Finally, I wish to acknowledge the support of staff of the Faculty of Education – Charles Sturt University. The support gained from the Faculty since 2004 has been unmeasurable, for which I am truly appreciative.
The current study was conducted to investigate preservice teachers’ understandings and expectations of students with learning disabilities. Attributional responses that teachers construct result in differing teacher affect, evaluative feedback and expectation of future performance. Once these understandings and expectations are embedded they are less likely to change over the span of a teaching career. This study therefore examined preservice teachers’ attributional responses to boys with a learning disability who had failed a class test. Preservice teachers’ attitudes towards students with learning disabilities, and their teacher efficacy were also explored in relation to their attributional responses. The instructional strategies that preservice teachers report they would use for students with learning disabilities were also considered.

Six hundred-sixty-seven preservice primary and secondary school teachers within New South Wales were studied across four University Campuses. Five kinds of instruments were administered to the subjects of the study: a demographic questionnaire, an attributional vignettes questionnaire, an attitudes questionnaire, a teacher efficacy scale questionnaire, and, an instructional strategies questionnaire. Each University within New South Wales is required, by the Department of Education and Training (DET), to include a compulsory inclusive education subject within their course design. To investigate the influence that the compulsory inclusive education subject has on preservice teachers, the study included preservice teachers who had and had not completed the subject.

The results of the study showed that preservice teachers form a negative attribution cycle about students with a learning disability, which is in stark contrast to the positive attribution cycle that they form about students without a learning disability. The findings show that preservice teachers view students with a learning disability more from a medical model viewpoint that emphasises deficits. Thus, they are generally more positive towards students with a learning disability, less frustrated, more sympathetic, and have lower expectations of their future performances.
Philosophically, their educational view towards students with a learning disability is driven by ability, rather than effort, which is in contrast to their view towards students without a learning disability. Preservice teachers also report they would use more teacher-centred instructional strategies for students with learning disabilities, in comparison to using higher cognitive level instructional strategies in a student-centred environment for students without a learning disability. The application of teacher efficacy to this study suggested that preservice teachers who believed, and were confident in their own teaching abilities, were more likely to have a greater academic focus on classroom instructional strategies and outcomes. Similarly, preservice teachers with a greater positive attitude towards students with a learning disability had higher expectations of these students and reported greater use of higher cognitive level instructional strategies in a student-centred environment.

Finally, the study suggests recommendations and implications for practice and future research in regards to understandings and expectations of students with learning disabilities.
# TABLE OF CONTENTS

## VOLUME I

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATEMENT OF ORIGINALITY</td>
<td>III</td>
</tr>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>IV</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>V</td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td>VII</td>
</tr>
<tr>
<td>LIST OF ABBREVIATIONS</td>
<td>XV</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>XVII</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>XIX</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>XIX</td>
</tr>
<tr>
<td>CHAPTER 1 – INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>1.1  INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>1.2  PURPOSE OF THE STUDY</td>
<td>2</td>
</tr>
<tr>
<td>1.3  LOCATION OF THE STUDY</td>
<td>3</td>
</tr>
<tr>
<td>1.3.1 The Sites</td>
<td>3</td>
</tr>
<tr>
<td>1.3.2 Participants</td>
<td>4</td>
</tr>
<tr>
<td>1.4  SIGNIFICANCE OF THE STUDY</td>
<td>4</td>
</tr>
<tr>
<td>1.5  THEORETICAL CONTRIBUTION TO PRACTICE</td>
<td>5</td>
</tr>
<tr>
<td>1.6  STRUCTURE OF THE THESIS</td>
<td>8</td>
</tr>
</tbody>
</table>
## CHAPTER 2 – LITERATURE REVIEW

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>INTRODUCTION</td>
<td>10</td>
</tr>
<tr>
<td>2.2</td>
<td>LEARNING DISABILITIES</td>
<td>11</td>
</tr>
<tr>
<td>2.2.1</td>
<td>Overview</td>
<td>11</td>
</tr>
<tr>
<td>2.2.2</td>
<td>Historical Background of LD</td>
<td>12</td>
</tr>
<tr>
<td>2.2.2.1</td>
<td>Historical Work in the Field of LD</td>
<td>12</td>
</tr>
<tr>
<td>2.2.2.2</td>
<td>Defining and Understanding LD</td>
<td>14</td>
</tr>
<tr>
<td>2.2.2.3</td>
<td>Identifying LD</td>
<td>18</td>
</tr>
<tr>
<td>2.2.2.4</td>
<td>Current Trends in Australia</td>
<td>19</td>
</tr>
<tr>
<td>2.2.3</td>
<td>Prevalence of LD</td>
<td>23</td>
</tr>
<tr>
<td>2.3</td>
<td>ATTRIBUTION THEORY</td>
<td>23</td>
</tr>
<tr>
<td>2.3.1</td>
<td>Some Important Principles of Attribution Theory</td>
<td>24</td>
</tr>
<tr>
<td>2.3.1.1</td>
<td>Self Perceptions</td>
<td>25</td>
</tr>
<tr>
<td>2.3.1.2</td>
<td>Process Underlying an Attribution</td>
<td>26</td>
</tr>
<tr>
<td>2.3.1.3</td>
<td>Factors Relating to Attribution Theory</td>
<td>26</td>
</tr>
<tr>
<td>2.3.2</td>
<td>Motivational Dimensions in Attribution Theory</td>
<td>27</td>
</tr>
<tr>
<td>2.3.3</td>
<td>Relationship between the Attributional Model and Achievement-Related Behaviour</td>
<td>29</td>
</tr>
<tr>
<td>2.4</td>
<td>AN ATTRIBUTIONAL APPROACH TO ACHIEVEMENT OUTCOMES</td>
<td>30</td>
</tr>
<tr>
<td>2.4.1</td>
<td>Attributions Teachers Have About Students</td>
<td>31</td>
</tr>
<tr>
<td>2.4.2</td>
<td>How Teacher Attribution Affects Actions toward Students</td>
<td>32</td>
</tr>
<tr>
<td>2.4.3</td>
<td>Attributional Messages and Student Performance</td>
<td>34</td>
</tr>
<tr>
<td>2.4.4</td>
<td>Academic Achievement of Students with LD</td>
<td>37</td>
</tr>
<tr>
<td>2.4.5</td>
<td>Teacher Attribution and LD as a Cause for Failure</td>
<td>39</td>
</tr>
<tr>
<td>2.5</td>
<td>EXPECTANCY-VALUE THEORIES OF MOTIVATION</td>
<td>44</td>
</tr>
<tr>
<td>2.6</td>
<td>ATTITUDES TOWARD STUDENTS WITH LD</td>
<td>47</td>
</tr>
<tr>
<td>2.6.1</td>
<td>Role of Beliefs</td>
<td>47</td>
</tr>
<tr>
<td>2.6.2</td>
<td>Factors Influencing Teachers’ and Preservice Teachers’ Attitudes toward Students with Special Educational Needs</td>
<td>48</td>
</tr>
</tbody>
</table>
3.3.2 Sample 83

3.4 RESEARCH DESIGN 83

3.5 DATA COLLECTION INSTRUMENTS 84

3.5.1 Section One: Demographic Questions 85

3.5.2 Section Two: Attributional Vignettes Questionnaire 85

3.5.2.1 Scoring 88

3.5.2.2 Development, Reliability and Validity of the Attributional Vignettes Questionnaire 88

3.5.2.3 Recent Research with the Vignettes Questionnaire 89

3.5.3 Section Three: Attitude Questionnaire 90

3.5.3.1 Scoring 90

3.5.3.2 Development, Reliability and Validity of the Survey of Practices with Students of Varying Needs 91

3.5.4 Section Four: Teacher Efficacy Scale Questionnaire 91

3.5.4.1 Scoring 92

3.5.4.2 Development, Reliability and Validity of the Teacher Efficacy Scale 92

3.5.4.3 Recent Research with the Teacher Efficacy Scale 94

3.5.5 Section Five: Instructional Strategies Questionnaire 96

3.5.5.1 Scoring 96

3.5.5.2 Development, Reliability and Validity of the Instructional Strategies Questionnaire 96

3.5.5.3 Recent Research with the SOP and DPS 97

3.6 DATA COLLECTION PROCEDURE 97

3.6.1 Approval 97

3.6.1.1 Human Experimentation Ethics Committee (University of Wollongong) 98

3.6.1.2 Heads of the Faculties of Education at each University 98

3.6.1.3 Participants’ Permission 98

3.6.2 Pilot Study 99

3.6.3 Administration of Instrument 99
### DATA ANALYSIS

3.7.1 Data Coding 100
   - 3.7.1.1 Demographic Questions 100
   - 3.7.1.2 Attributional Vignettes Questions 101
   - 3.7.1.3 Attitude Questions 102
   - 3.7.1.4 Teacher Efficacy Questions 103
   - 3.7.1.5 Instructional Strategies Questions 104

3.7.2 Missing Data and Outliers 104

3.7.3 Data Normality 107

3.7.4 Data Sample Comparisons 109

3.7.5 Data Consolidation 110

3.7.6 Analysis Design 113
   - 3.7.6.1 Stages of Analysis 113
     - 3.7.6.1.1 Statistical Protocols Relating to Each Hypothesis 116
   - 3.7.6.2 Structural Equation Modelling 120
     - 3.7.6.2.1 Data Preparation for the SEM 121
     - 3.7.6.2.2 The Conceptual Model 123
     - 3.7.6.2.3 The Development of the Measurement Models 124
     - 3.7.6.2.4 The Development of the Structural Models 124
     - 3.7.6.2.5 Post-Hoc Analysis 126

### CHAPTER SUMMARY

126

### CHAPTER 4 – RESULTS

128

4.1 INTRODUCTION 128

4.2 CHARACTERISTICS OF THE SAMPLE 129
   - 4.2.1 Composition of Sample by Gender 129
   - 4.2.2 Composition of Sample by Age 130
   - 4.2.3 Composition of Sample by LD Experience 131
   - 4.2.4 Composition of Sample by Completion of Inclusive Education 131

4.3 ATTRIBUTIONAL VIGNETTE RESPONSES 132
   - 4.3.1 Feedback 134
4.10  STRUCTURAL EQUATION MODEL DEVELOPMENT 181
4.10.1 Development of the Measurement Models 181
  4.10.1.1 Measurement Model One 182
  4.10.1.2 Measurement Model Two 183
  4.10.1.3 Measurement Model Three 185
  4.10.1.4 Measurement Model Four 186
  4.10.1.5 Measurement Model Five 188
  4.10.1.6 Measurement Model Six 189
  4.10.1.7 Reliability of Measurement Models 191
4.10.2 Development of the Structural Models 192
  4.10.2.1 Combined Model 192
  4.10.2.2 Structural Equation Model One 194
  4.10.2.3 Structural Equation Model Two 197
  4.10.2.4 Structural Equation Model Three 200
  4.10.2.5 The Overall Fit of the Model 202
    4.10.2.5.1 Absolute Fit Measures 202
    4.10.2.5.2 Incremental Fit Measures 203
    4.10.2.5.3 Parsimonious Fit Measures 203
  4.10.2.6 Post-Hoc Model Fitting 203
    4.10.2.6.1 Fit of Model Using GLS Estimation 204
    4.10.2.6.2 A Cross-Validation Analysis Using Sample Two. 206
4.11  EXAMINATION OF THE CRITICAL RATIOS 208
  4.11.1 Critical Ratios to LD Instructional Strategies 209
  4.11.2 Critical Ratios to Attributional Responses toward Students with
         LD 209
    4.11.2.1 Feedback 210
    4.11.2.2 Frustration 210
    4.11.2.3 Sympathy 211
    4.11.2.4 Expectation of Future Failure 211
4.12  GROUP COMPARISON (INCLUSIVE EDUCATION) 212
CHAPTER 5 – DISCUSSION AND CONCLUSIONS

5.1 INTRODUCTION

5.2 GENERAL OVERVIEW OF FINDINGS

5.2.1 Attributions

5.2.2 Attitudes

5.2.3 Teacher Efficacy

5.2.4 Instructional Strategies

5.2.5 Structural Equation Modelling

5.3 CONCLUSIONS ON HYPOTHESES

5.3.1 Hypothesis 1 Testing

5.3.2 Hypothesis 2 Testing

5.3.3 Hypothesis 3 Testing

5.3.4 Hypothesis 4 Testing

5.3.5 Hypothesis 5 Testing

5.3.6 Hypothesis 6 Testing

5.4 LIMITATIONS OF THE STUDY

5.5 RECOMMENDATIONS AND RESEARCH IMPLICATIONS

5.6 CONCLUSION

REFERENCE LIST

APPENDICES
## LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACLD</td>
<td>Association for Children with Learning Disabilities</td>
</tr>
<tr>
<td>ADHD</td>
<td>Attention Deficit Hyperactivity Disorder</td>
</tr>
<tr>
<td>ALDA</td>
<td>Australian Learning Disability Association</td>
</tr>
<tr>
<td>AMOS</td>
<td>Analysis of MOment Structures</td>
</tr>
<tr>
<td>AUSPELD</td>
<td>Australian Federation of Specific Learning Difficulties Associations</td>
</tr>
<tr>
<td>BD</td>
<td>Behaviour Disorders</td>
</tr>
<tr>
<td>CEEBI</td>
<td>Character Education Efficacy Belief Instrument</td>
</tr>
<tr>
<td>CFI</td>
<td>Comparative Fit Index</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>Ratio of Minimum Discrepancy to Degrees of Freedom</td>
</tr>
<tr>
<td>CR</td>
<td>Critical Ratio</td>
</tr>
<tr>
<td>CSU</td>
<td>Charles Sturt University</td>
</tr>
<tr>
<td>DET</td>
<td>Department of Education and Training</td>
</tr>
<tr>
<td>df</td>
<td>Degrees of Freedom</td>
</tr>
<tr>
<td>Diff Att</td>
<td>Attitudes towards Differentiation</td>
</tr>
<tr>
<td>DPS</td>
<td>Differentiated Practices Survey</td>
</tr>
<tr>
<td>DV</td>
<td>Dependent Variable</td>
</tr>
<tr>
<td>GLS</td>
<td>Generalised Least Squares</td>
</tr>
<tr>
<td>GTE</td>
<td>General Teacher Efficacy</td>
</tr>
<tr>
<td>ISQ</td>
<td>Instructional Strategies Questionnaire</td>
</tr>
<tr>
<td>IV</td>
<td>Independent Variable</td>
</tr>
<tr>
<td>LD</td>
<td>Learning Disability</td>
</tr>
<tr>
<td>LD Att</td>
<td>Attitudes towards Students with a Learning Disability</td>
</tr>
<tr>
<td>LDFailFS</td>
<td>Independent Dimension Variable with Factor Loadings for Expectation of Future Failure towards Students with LD.</td>
</tr>
<tr>
<td>LDFeedFS</td>
<td>Independent Dimension Variable with Factor Loadings for Feedback Given to Students with LD.</td>
</tr>
<tr>
<td>LDFrustFS</td>
<td>Independent Dimension Variable with Factor Loadings for Frustration towards Students with LD.</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>LD Strat</td>
<td>Higher Cognitive Level Instructional Strategies for Students with LD</td>
</tr>
<tr>
<td>LDSympFS</td>
<td>Independent Dimension Variable with Factor Loadings for Sympathy towards Students with LD.</td>
</tr>
<tr>
<td>MANOVA</td>
<td>Multivariate Analysis of Variance</td>
</tr>
<tr>
<td>MI</td>
<td>Modification Indices</td>
</tr>
<tr>
<td>ML</td>
<td>Maximum Likelihood</td>
</tr>
<tr>
<td>MQU</td>
<td>Macquarie University</td>
</tr>
<tr>
<td>$\eta^2$</td>
<td>Partial Eta Squared</td>
</tr>
<tr>
<td>NACHC</td>
<td>National Advisory Committee on Handicapped Children</td>
</tr>
<tr>
<td>NJCLD</td>
<td>National Joint Committee on Learning Disabilities</td>
</tr>
<tr>
<td>NLD</td>
<td>Non-Learning Disability</td>
</tr>
<tr>
<td>NRRCGT</td>
<td>National Research Centre for the Gifted and Talented</td>
</tr>
<tr>
<td>NSW</td>
<td>New South Wales</td>
</tr>
<tr>
<td>PGFI</td>
<td>Parsimonious Goodness-of-Fit Index</td>
</tr>
<tr>
<td>PTE</td>
<td>Personal Teacher Efficacy</td>
</tr>
<tr>
<td>RMSEA</td>
<td>Root Mean-Square Error of Approximation</td>
</tr>
<tr>
<td>RMSR</td>
<td>Root Mean Squared Residual</td>
</tr>
<tr>
<td>SEM</td>
<td>Structural Equation Model</td>
</tr>
<tr>
<td>SIPFQ</td>
<td>Social Interaction Program Features Questionnaire</td>
</tr>
<tr>
<td>SOP</td>
<td>Survey Of Practices (Instrument)</td>
</tr>
<tr>
<td>SPSS</td>
<td>Statistical Program for the Social Sciences</td>
</tr>
<tr>
<td>SRMSR</td>
<td>Standardised Root Mean Squared Residual</td>
</tr>
<tr>
<td>SRW</td>
<td>Standardised Regression Weight</td>
</tr>
<tr>
<td>TAS</td>
<td>Teacher Attribute Survey</td>
</tr>
<tr>
<td>TES</td>
<td>Teacher Efficacy Scale</td>
</tr>
<tr>
<td>TLI</td>
<td>Tucker-Lewis Index</td>
</tr>
<tr>
<td>TSES</td>
<td>Teachers’ Sense of Efficacy Scale</td>
</tr>
<tr>
<td>UOW</td>
<td>University of Wollongong</td>
</tr>
<tr>
<td>VET</td>
<td>Vocational Education and Training</td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>Chi Square</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

Figure 3.7.6.2. Hypothesised SEM Model from Theoretical Research .................. 125
Figure 4.2.1. Gender Characteristics ................................................................. 129
Figure 4.2.2. Age Characteristics .................................................................. 130
Figure 4.2.3. LD Experience Characteristics .................................................... 131
Figure 4.2.4. Inclusive Education .................................................................. 132
Figure 4.3.1. Preservice Teachers’ Feedback to Students .................................. 135
Figure 4.3.2. Preservice Teachers’ Frustrations towards Students ..................... 138
Figure 4.3.3 Preservice Teachers’ Sympathy towards Students ......................... 141
Figure 4.3.4 Preservice Teachers’ Expectations of Future Failure of
Students ............................................................................................................. 144
Figure 4.3.5 LD. Status Influence on Attributional Responses ......................... 147
Figure 4.10.1. Measurement Model One. LD Attitude ...................................... 182
Figure 4.10.2. Measurement Model Two. Differentiation Attitude ..................... 183
Figure 4.10.3. Measurement Model Three. General Teacher Efficacy ............... 185
Figure 4.10.4. Measurement Model Four. Personal Teacher Efficacy ............... 186
Figure 4.10.5. Measurement Model Five. LD Instructional Strategies ................ 188
Figure 4.10.6. Measurement Model Six. Attributional Responses toward
Students with LD .................................................................................................. 190
Figure 4.10.8. Combined Model: Attitude and Teacher Efficacy ....................... 192
Figure 4.10.9a. Initial Input Structural Equation Model One. Attitude,
Efficacy and Instructional Strategies ................................................................ 194
Figure 4.10.9b. Structural Equation Model One. Attitude, Efficacy and
Instructional Strategies ...................................................................................... 195
Figure 4.10.10a. Initial Input Structural Equation Model Two. Attitude,
Efficacy and Attributional Responses toward Students with LD .................... 197
Figure 4.10.10b. Structural Equation Model Two. Attitude, Efficacy and
Attributional Responses toward Students with LD .......................................... 198
Figure 4.10.11a. Initial Input Structural Equation Model Three. Full
SEM Model of Attitude, and Teacher Efficacy toward Attributional
Responses and Instructional Strategies to Students with LD ......................... 200
Figure 4.10.11b. *Structural Equation Model Three. Full SEM Model of Attitude, and Teacher Efficacy toward Attributional Responses and Instructional Strategies to Students with LD.* ............................................. 201

Figure 5.2.1. *Feedback (Ability)* ................................................................. 218

Figure 5.2.2. *Feedback (Effort)* ................................................................. 218

Figure 5.2.3. *Frustration (Effort)* ............................................................... 219

Figure 5.2.4. *Sympathy (Ability)* .............................................................. 220

Figure 5.2.5. *Sympathy (Effort)* ............................................................... 221

Figure 5.2.6. *Expectation of Future Failure (Ability)* .............................. 222

Figure 5.2.7. *Expectation of Future Failure (Effort)* ............................... 222

Figure 5.2.8. *Main effects of Expectation of Future Failure* ..................... 224
LIST OF TABLES

Table 3.5.1 A Matrix of Two by Two by Two Vignettes .................................................. 87
Table 3.7.1 Recoding of the Feedback Scores ................................................................. 102
Table 3.7.2 Recoding of the Personal Teacher Efficacy Statements ............................. 103
Table 3.7.3 Skewness and Kurtosis of Variables ......................................................... 108
Table 3.7.4: Logistic Regression Results for Vignette Responses ................................. 109
Table 3.7.6 Number and Percentage of Respondents used for Each MANOVA .................. 119
Table 3.7.6.2: Reliability from the Individual Factor Variables ..................................... 123
Table 4.3 Overall Multivariate Tests ............................................................................. 133
Table 4.3.1. Preservice Teachers’ Feedback to Boys with and without LD ............... 134
Table 4.3.2. Preservice Teachers’ Frustration Felt towards Boys with and without LD .......................................................... 137
Table 4.3.3. Preservice Teachers’ Sympathy Felt towards Boys with and without LD .................................................................................. 140
Table 4.3.4. Preservice Teachers’ expectations of Future Failure towards Boys with and without LD .................................................................................. 143
Table 4.4 Significant Comparisons of Attitudes towards Students with LD and Differentiating the Curriculum ......................................................... 149
Table 4.4.1 Influence of Inclusive Education Completion on Attitudes towards Students with LD and Differentiation ......................................................... 152
Table 4.5 Significant Comparisons of General and Personal Teacher Efficacy ............. 155
Table 4.5.1 Influence that Inclusive Education Completion has on General and Personal Teacher Efficacy .............................................................. 158
Table 4.6 Significant Comparisons of Frequency of use of Instructional Strategies ......... 160
Table 4.6.1 Influence that Inclusive Education Completion has on Frequency of use of Instructional Strategies ......................................................... 162
Table 4.6.2.1 Comparison of Frequency Rates for Use of Higher Cognitive Level Instructional Strategies For Students with and without LD ......................................................... 163
Table 4.10.9: Structural Model One Statistics .......................................................... 196
Table 4.10.10: Structural Model Two Statistics ....................................................... 199
Table 4.10.11: Structural Model Three Statistics ..................................................... 201
Table 4.10.12: Structural Model Three Statistics Using GLS Estimation.............. 204
Table 4.10.13: Structural Model Three Statistics Sample Data Set Two ............... 206
Table 4.11.1: Critical Rations of Final SEM ............................................................ 208
Table 4.12.1: Critical Ratios between Completion and non-Completion of
the Compulsory Inclusive Education Subject .................................................... 213
Table 5.3.3 Impact Inclusive Education Training has on Preservice
Teachers ............................................................................................................ 239
CHAPTER 1 – INTRODUCTION

1.1 INTRODUCTION

Over recent years, moves towards the inclusion of students with special needs in mainstream classrooms has brought about increasing attention to the way general education teachers perceive these students. Commensurate with this has been a growing interest in what may constitute educational success for children with special educational needs in mainstream classrooms, plus the ability of general education teachers to provide effective and appropriate instruction for them. Currently these mainstream, inclusive classrooms also suffer from limitations in funding and the provision of ongoing material resources and support, further adding to the difficulties faced by general education teachers. Taken together, these issues foreground a need to understand the beliefs and attitudes that general education teachers might hold, not only about their overall role as practitioners, but also in relation to those students in their classrooms who have difficulty learning.

The self beliefs that teachers have about their ability to influence the academic achievement and outcomes for learners with special educational needs are more than likely to impact upon their behaviour towards these students. Accompanying attitudes relating to the expectations general education teachers might have of students with different learning needs, including how they as teachers might explain or rationalise the academic outcomes that may or may not occur, will also influence their perceptions.

It has been well documented that teachers’ past experiences as learners are powerful in shaping conceptions and expectations about teaching diverse students (Flores & Day, 2006; Pop, 2008). It is known that teachers form beliefs about the process of teaching during their preservice training and also that once a belief has been held for a long time, it becomes extremely difficult to change (Bandura, 1977). Upon this basis it could be argued that the phase of preservice training could be considered a critical period during which time beliefs and attitudes are more likely to be influenced by external sources and that therefore, teacher training programs may indeed have a role
to play. Consequently it was considered that the need to further explore preservice teachers’ perceptions, understandings, expectations and behaviours in relation to students who have what is termed learning disabilities (LD), is indeed critical.

In light of these issues, this study was developed to provide an in-depth exploration of urban, suburban and rural preservice, primary and secondary teachers’ attitudes about students with LD.

1.2 PURPOSE OF THE STUDY

This study examined the attributions, attitudes, teacher efficacy, and intended performance of preservice teachers in relation to students with LD. Further this study investigated possible influential relationships that preservice teachers’ attitudes and teacher efficacy have concerning their attributional responses and instructional strategies for students with LD.

Toward this end, the following research questions were devised to guide the study:

1. How do preservice teachers differ in the ways that they attribute the successes and failures of students with LD and those without LD?

2. In what ways would preservice teachers use different instructional strategies at different frequencies for students with LD in comparison to students without LD?

3. How significantly do compulsory inclusive education subjects at tertiary institutions influence preservice teachers’ attitudes towards students with LD and differentiation of the curriculum, teacher efficacy, and perceived use of instructional strategies for students with LD?

4. To what extent is there a relationship among preservice teachers’ attitudes towards students with LD, their attitudes towards differentiating the curriculum, and their teacher efficacious levels?
5. To what extent are preservice teachers’ attitudes and teacher efficacious levels predictive of their preferred instructional strategies for students with LD?

6. To what extent do the responses that preservice teachers give students with LD differ due to their attitudes and teacher efficacious levels towards students with LD?

This study aims to provide knowledge about preservice teachers’ perceptions, understandings, and expectations of students with LD, which will assist and inform tertiary institutions in the way they prepare preservice teachers for classroom teaching in inclusive classrooms within Australia.

1.3 LOCATION OF THE STUDY

1.3.1 The Sites

The research focused on preservice teachers in a variety of urban, suburban, and rural regions across New South Wales (NSW). The participants in the study came from three universities across four campuses, which included Sydney (Macquarie University), Wollongong (University of Wollongong), Wagga Wagga, and Bathurst (Charles Sturt University). Each of the campuses differed in demographics of preservice teachers covering a wide array of the population within New South Wales.

While Sydney and Wollongong hold 21% and 1.3% of the Australian population respectively, Wagga Wagga and Bathurst each hold only around 0.2% of the Australian population (Australian Bureau of Statistics, 2007). The majority of students at Macquarie University (Sydney) and University of Wollongong are from urbanised and suburbanised regions within NSW (Macquarie University Annual Report 2006; UOW Annual Report 2005), whereas, a larger proportion of students at Charles Sturt University (Wagga Wagga and Bathurst) come from rural regions within NSW (CSU Statistical Profile 2005). Thus, the study aimed to gain a broader snapshot
of perceptions, understandings, and expectations amongst preservice teachers across the State of New South Wales.

1.3.2 Participants

The participants used in the study ranged from undergraduate to postgraduate preservice teachers, training to teach primary and secondary school students. A total of 667 preservice teachers were used in the study. Due to the fact that a compulsory inclusive education subject could impact upon how preservice teachers respond to the survey instrument, this study aimed to collect data from half of the respondents prior to, and half after completing the compulsory subject.

1.4 SIGNIFICANCE OF THE STUDY

The potential impact of the proposed study of preservice teachers’ perceptions, understandings, and expectations of students with LD is very important in understanding how such teachers behave towards and instruct these students. This study is significant because it sheds light upon preservice teachers’ perceptions, knowledge and understanding of students with LD, and to what extent their training in tertiary institutions prepares and impacts upon them.

Whether teachers are aware or not, they have perceptions and expectations of students and their academic and social success. This can influence judgements and decisions about how they will teach the students, which in turn, can have consequences for students’ performances and achievements.

A disservice exists if teachers communicate to students with LD that a student’s effort and their effort (as a teacher) is not likely to change past failures because the student’s success is due to the ‘disability’ that is beyond their (student’s and teacher’s) control. Although these beliefs would never be verbalised as such, ‘actions speak louder than words’. Students learn more by what teachers do than what they say (Lavoie, 1989), and often hidden (indirect) messages are received by students. These messages can
then influence their own expectations of themselves, and their self-esteem, which in turn can impact upon their performances and achievements.

With predetermined perceptions and expectations often grounded prior to becoming practising teachers and which are unlikely to significantly change once they become practising teachers, it is necessary to shed light upon these issues. McLaughlin (1986) identifies the teacher as the most important resource in schools, yet preparation of teachers in tertiary institutions over recent years has been criticised for lacking in the area of teaching in inclusive classrooms (Barton, 2003; Booth, Nes & Stramstod, 2003; Jones, 2002; Lancaster & Bain, 2007; Smith & Smith, 2000; Winter, 2006). Moreover, once trained, little is done to promote the continued learning and improvement for those in the profession (Bourke, 2008; Brooks, 2006; DeSimone & Parmar, 2006).

With LD being one of the most common disabilities in the classroom (Clark & Artiles, 2000; DeSimone & Parmar, 2006) it is acutely significant to examine not only preservice teachers’ perceptions, understanding, and expectations of students with LD, but also how tertiary institutions are preparing them for the current inclusive education milieu.

### 1.5 THEORETICAL CONTRIBUTION TO PRACTICE


Over recent decades, attribution theory has become a dominant concept in the field of academic motivation and achievement. Weiner’s model of attribution theory is conceptualised into two interrelated theories. The first conceptual theory Weiner termed ‘intrapersonal attribution theory’ which is internalised within the individual. In
this theory, the individual predicts future outcomes, focusing on their own expectancy for future success. This entails self-directed thoughts, and feelings including self-esteem, guilt, shame, pride, embarrassment and others (Weiner, 2000).

The second conceptual theory Weiner termed ‘interpersonal attribution theory’ and it is externalised to significant others (teacher, peers, friends, parents, etc.). These individuals make predictions on future outcomes for the student, focusing on their expectation of the student’s future success. The focus is on judgements made by significant others, regarding whether the individual is good or bad, responsible or not responsible, and the target for frustration and anger, or sympathy (Weiner, 2000).

Weiner’s interpersonal attribution theory suggests that teachers apply attributions to their daily classroom experiences. As students work on class tasks each day, where some are successful and others are not, teachers feel emotions congruent with the outcomes, where happiness generally follows success and sadness generally follows failure. All teachers have an aspiration for their students to succeed to the greatest possible heights. However, often teachers find themselves asking questions as to why a student regularly fails/struggles, or why a student, who regularly fails/struggles, succeeded. These questions often emerge following two types of outcomes, negative outcomes and unexpected outcomes. Weiner believes that it is through these questions that teachers begin to apply attributions to their daily classroom activities.

Bandura’s social cognitive theory, on the other hand, suggests that an individual’s self-efficacy is affected by several factors: outcome expectations and efficacy expectations. Outcome expectations are based on the anticipated outcomes which relate to the individual’s actions. Efficacy expectations are based on the confidence an individual has in themselves to be able to carry out an action in an effort to reach the goal. The persistence one has in carrying out an action or not, is often determined by their level of confidence. Those with a high level of outcome and efficacy expectations are ensured greater success as they continue to persist in tasks when confronted by difficulties. Consequently, those with a low level of outcome and efficacy expectations will, more than likely, falter when confronted by difficulties.
The efficacious level at which individuals perceive themselves to be, in relation to an activity or experience, is likely to contribute towards their choice of activity and attention to the activity. A teacher’s efficacious level can have a direct impact upon the students and their self-efficacious level, which can in turn impact upon the students’ achievements in the classroom (Ashton & Webb, 1986; Dembo & Gibson, 1985; Tschannen-Moran, Woolfolk-Hoy & Hoy, 1998).

Teacher efficacy, in general terms, refers to the extent to which teachers believe they can have an influence on their students’ academic achievements (Dembo & Gibson, 1985; Gibson & Dembo, 1984). Thus, those teachers who hold a high efficacious level are confident that they can impact student achievement. These types of teachers tend to set higher goals for themselves, have higher expectations of students, and work harder and persist longer to achieve the desired outcomes (Earley & Lituchy, 1991). Alternatively, those teachers who hold a low efficacious level, also lack confidence in influencing students’ achievements. The difficulties that these teachers encounter are generally seen as problems, rather than challenges (Tschannen-Moran et al., 1998).

While various researchers have drawn upon Weiner’s and Bandura’s work to better understand other educational issues and contexts, no researchers have specifically applied Weiner’s and Bandura’s theories to the way in which preservice teachers perceptually view students with LD, nor how these relate to each other and the behavioural outcomes by preservice teachers in the classroom.

In particular, this study examines Weiner’s ‘interpersonal attribution model’ by comparing preservice teachers’ attributions towards students with and without LD in relation to their academic achievements. The study also considers Bandura’s ‘teacher efficacy’ within the social cognitive domain and considers relationships between teacher efficacy and attitudes towards students with LD and differentiating the curriculum. Furthermore, the study considers the attitudinal and efficacious influences that impinge upon (a) the attributional responses towards students with LD, and (b) the instructional strategies perceived to be used in the classroom for students with LD.


1.6 STRUCTURE OF THE THESIS

The study is divided into five chapters. The broad purpose of each is summarised below.

Chapter one has introduced the research topic, outlined the purpose of the study and delineated the parameters within which the study was conducted. It has also provided an insight into why the research is significant and an overview of the theoretical and practical contributions of the study.

Chapter two provides a more detailed account of the theoretical approach adopted, and reviews the literature, beginning with a discussion of current issues surrounding LD concerning definitional and identification matters, impinging upon knowledge and understandings of students with LD. It then explores the theoretical underpinnings of attribution theory, and applies it to the context of LD. Attitudes towards students with LD and differentiation of the curriculum, are then discussed. The theoretical foundation of teacher efficacy within the domain of social cognitive theory outlines the implications that this can have on students with LD. Finally, the consequences that these can have on instructional strategies used for students with LD are then reviewed.

Chapter three details the methodology of the study, including the hypotheses and exploratory questions, which were derived from a study of the literature. In this chapter the population and sample used for the study are outlined in detail. The research design and development of the instruments utilised to gather the data used in the analyses are scrutinised. Chapter three also outlines the process of the data collection and the preparation of the data set prior to carrying out the formal analysis. The steps in the analysis processes are then explicated.

Chapter four presents the results of the data collection beginning with descriptive statistics about the participants used in the study. It then outlines the results for each theoretical component of the study (attribution, attitudes, teacher efficacy, and instructional strategies). Correlations between the attitudinal and efficacious theoretical components are then presented. The chapter follows on with relationships and implications that the attitudinal and efficacious theoretical components have on
the attributional responses and intended instructional strategies used in relation to students with LD. Finally, the chapter presents the development of a theoretical model produced by structural equation modelling that depicts the influential impact of attitudinal and efficacious components on the attributional responses and instructional strategies in relation to students with LD.

Chapter five integrates the results of the study reported in the preceding chapter, particularly with regard to the relationship of findings between the varied analyses carried out in the preceding chapter. Furthermore, this chapter outlines the implications of the findings, identifies the limitations of the study and then suggests implications for practice and further areas of research. Finally, an overall conclusion to the study is delineated.
Chapter 2 – LITERATURE REVIEW

2.1 INTRODUCTION

As inclusive education continues to gain strength and momentum for students with diverse needs and abilities, it is important to understand how educators perceive the academic outcomes of these students. Students with learning disabilities (LD) form the largest group of students with diverse needs and abilities in inclusive classrooms (Clark, 1997; Clark & Artiles, 2000). Thus, the way in which educators perceive the achievement of students with LD in comparison to those without LD is of great significance. Also of significance are educators’ beliefs about their influence on the learning and achievement of students with LD, and their beliefs and attitudes towards them. Finally, it is essential to understand whether any of these elements impact upon the responses and strategies that teachers use within the classroom. This chapter will discuss what research has found in relation to these issues.

The purpose of this chapter is to review and analyse research and theory which relate to the research questions motivating this study. In order to do this, the chapter is organised into the following key areas:

- LD
- Attribution theory
- Expectancy-value theories of motivation
- Attitudes towards students with LD
- Social cognitive theory
- Misdiagnosing students’ potential to learn

This chapter will deliberate the historical and contemporary issues surrounding the understanding of LD in regards to defining and identifying LD internationally and within Australia. It will also discuss attribution theory and the role it plays in how teachers perceive the achievement of students with and without LD. Furthermore the chapter considers the relationship between attributional approach and achievement outcomes. In regards to expectancy-value theories of motivation, the literature review
will consider the links that attribution theory has with expectancy-value theories, and how attribution affects student motivation to class work.

Educators’ attitudes towards students with diverse needs and abilities, and more specifically students with LD, are also considered. Following this, the literature review will discuss the underlying major concepts of social cognitive theory and the impact that it can have on students’ achievements. Moreover, it will detail the concepts in teacher efficacy and factors that affect teacher efficacy.

Finally, the chapter examines the relationship between teacher response to LD, efficacy, expectancy, and student achievement; and issues surrounding the misdiagnosing of students’ potential to learn.

2.2 LEARNING DISABILITIES

2.2.1 Overview

Most educators, parents, and children are familiar with the term, learning disability (LD). The majority of educators would have come across students labelled as such within their classroom at some stage. Parents and children are likely to have some awareness of the term through knowing someone who has been diagnosed with LD. Over the past few decades the awareness of LD has grown immeasurably. Increasing numbers of children and adults are being diagnosed with LD. Some of the possible explanations for this growth in identification of LD can include: (1) recognition of the significant academic and social problems realised by individuals with LD; (2) greater identification of girls with LD; (3) greater social acceptance of LD over other categories of special education (during the same period in which LD identification has increased significantly, identification of intellectual impairment has decreased significantly); (4) increasing needs for literacy at home; (5) broad and vague definitions of LD; (6) financial incentives to identify students for special education; and, (7) inadequate preparation of teachers by tertiary institutions, leading to over-referral of students with any type of special need (Arceneaux, 2006; Gresham,
Research within the field of LD has also risen significantly over recent years. It has possibly highlighted issues surrounding LD, improved and set up support networks for students with LD and parents of those with LD, and gained status for students to access support within education and the wider community. Unfortunately, though, with the upsurge of interest and work in the LD field, defining LD and identifying those with LD is one of the most controversial and complex issues within special education today.

2.2.2 Historical Background of LD

2.2.2.1 Historical Work in the Field of LD

Learning disabilities were virtually unknown as a field until the 1960s (Coles, 1987). Although some researchers of the history of LD recognize work throughout the nineteenth century (such as Franz Gall, John Bouillaud and Paul Broca), the first major discussions, around what we now know as LD, were published in the late nineteenth century. James Hinshelwood, a Glasgow ophthalmologist, is cited as one of the first major figures in what would become the field of learning disabilities (Coles, 1987). From 1895, the ophthalmologist had been studying visual perceptual problems, which he termed ‘word blindness’. His report of severe defects in visual memory documented severe reading difficulty (word blindness) in children with normal intelligence ( Gearheart, 1985). Hinshelwood published work identifying teaching strategies to help support students with ‘word blindness’. The basic tenets offered by Hinshelwood were further developed by Samuel Orton, a specialist in neurology and neuropathology. In 1937 Orton proposed a theory on how the brain functioned and coined the word ‘strephosymbolia’ (twisted symbols) to describe the memory-for-word pattern and letter orientation problems of the subjects that he worked with (Gearheart, 1985). The term ‘strephosymbolia’ was later to become known as ‘dyslexia’.
The term ‘learning disability’ was first formally introduced during what researchers named the ‘emergent period’ (Hallahan & Mercer, 2002; Lerner 2000; Wiederholt 1974), in 1962 by psychologist Samuel Kirk. In his book ‘Educating Exceptional Children’ he first defined LD as

a retardation, disorder, or delayed development in one or more of the processes of speech, language, reading, writing, arithmetic, or other school subjects resulting from a psychological handicap caused by a possible cerebral dysfunction and/or emotional or behavioural disturbances. It is not the result of mental retardation, sensory deprivation, or cultural and instructional factors. (Kirk, 1962, p. 263)

From the 1930s, Samuel Kirk had worked with students, whom he eventually termed learning disabled, following on from Hinshelwood’s earlier work. Kirk worked with “mentally retarded” children (whom he suspected might not actually be mentally retarded). Kirk was particularly interested in the role of language development and revealed that those children he had been working with, who were labelled and understood to be “mentally retarded”, in fact had normal intelligence. Thus, the term ‘learning disability’ was born (Gearheart, 1985). In 1963 Kirk presented this term in addressing a group of parents at an American conference on the ‘Exploration into Problems of Perceptually Handicapped Children’. The parents and educators at the conference meeting were concerned and wanted to link the isolated parent groups, active in some communities, into a single organisation (Lerner, 1985). After hearing Kirk’s presentation and introduction to the term learning disability the parents and educators gave immediate approval. They named their new organisation the ‘Association for Children with Learning Disabilities’ (ACLD), which is now known as the ‘Learning Disabilities Association of America’ (Hallahan & Mock, 2003).

Although the term LD had immediate appeal and acceptance, the task of developing a definition and identification of LD proved to be a challenge (and is still a challenge today). Defining the term LD in a way that is acceptable by all has continued to be a debatable issue since the inception of the field (Fletcher, Lyon, Fuchs & Barnes, 2007; Kavale, Holdnack & Mostert, 2006; Sideridis, 2007; Townsend, 2006).
2.2.2.2 Defining and Understanding LD

Since Kirk introduced the term LD, the field has exploded with greater interest by researchers, educators, parents and the wider community. Since the 1960s LD has experienced unprecedented growth and has had significant impact on special education, but it has been characterised by conflict and confusion about the exact definition, methods of assessment, and identification of the condition (Fletcher et al., 2007; Kavale & Forness, 2000; Kavale et al., 2006; Johnson, Mellord & Byrd, 2005; Townsend, 2006; Turkington & Harris, 2003). Until the LD term was first introduced, a variety of names were used to describe these types of children. Some of these included underachievement, perceptual-motor disorder, perceptual/attention deficit, psycholinguistic retardation, perceptual and communication disorders, hyperactivity, hyperkinesis, hypermotility, distractibility, impulsivity, dyslexia, dyscalculia, brain injury, minimal brain damage, developmental aphasia, minimal cerebral dysfunction, neurological impairment and psychoneurological learning disability (Adelman & Taylor, 1986; Coles, 1987; Epps, Ysseldyke & Algozzine, 1985; Hammill, Leigh, McNutt & Larsen, 1988; Ross, 1977). Since the term LD was introduced, the majority of these terms are no longer used. However, some are still in use and come under the umbrella of LD.

When Kirk created the term LD in the early 1960s the controversy began over how it should be defined. The fact that those who fitted into the category of LD had problems that could not be attributed to causes such as limited school attendance, low intelligence, emotional disturbance or sensory impairments (causes through exclusion of attributes), caused part of the problem in defining the term (Elkins, 2002). By 1968 a compromise was made by America’s National Advisory Committee on Handicapped Children (NACHC). The resulting definition was given official approval throughout the US when it was incorporated into the federal legislation in 1969 (Adelman & Taylor, 1986). The definition stated that those with specific learning disabilities are those who have:
A disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in an imperfect ability to listen, think, speak, read, write, spell or to do mathematical calculations. The term includes such conditions as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. The term does not include children who have learning problems which are primarily the result of visual, hearing, or motor handicaps, of mental retardation, or emotional disturbance, or of environmental, cultural or economic disadvantage. (NACHC, 1968, cited in Hammill, 1990, p. 77)

While this was a useful definition for legislative reasons, it was controversial from the beginning (Adelman & Taylor, 1986). From 1968 onwards organisations, researchers, educators and others in the LD field understood the necessity for a widely accepted definition of learning disabilities for the future of the field. However, the field has been wrestling with definitional issues since (Sideridis, 2007).

A number of definitions have been generated and used over the years, however, each has been judged by some to have certain shortcomings (Sideridis, 2007). In Wiederholt’s 1974 historical review of the field of LD he wrote: “despite [the] rapid growth during the 1960s and ‘70s, or perhaps because of it, the LD field is currently confronted with several major problems. These include problems of definition, territorial rights, and an adequate data base” (p. 43). According to some researchers (Hallahan & Mercer, 2002; Lerner, 2000) this was particularly so in the period between 1985 and 2000, which they termed the ‘turbulent period’. During this period of time several impacts occurred that solidified the field of LD even further. However, several issues also threatened to tear the field apart (Hallahan & Mercer, 2002). One of the main concerns was the vast increase in students being identified and diagnosed with LD. Even though some researchers argued that there were some relevant and valid reasons for this (Arceneaux, 2006; Gresham et al., 1997; MacMillan et al., 1998; Stampilzis & Polychronopoulou, 2008; Vaughn & Fuchs, 2003), the majority acknowledged that this could have possibly been to do with over-diagnosing children with LD.
During the ‘turbulent period’ new and revised definitions of LD surfaced, attempting to develop a valid and widely acceptable definition. It is hard to understand how a professional could “successfully identify, diagnose, prescribe treatment for, teach or remediate, motivate, or generally improve the life of a person who has a learning disability without first having a clear and accurate idea of the nature of a learning disability” (Hammill, 1990, p. 74). Even though there is still no fully accepted universal definition of LD, the turbulent period through to today has brought about some considerable agreements surrounding a definition for LD. In his study reviewing official definitions of LD, from Kirk’s first definition through to the turbulent period, Hammill concluded that “contrary to popular opinion, considerable agreement exists today among the definitions and definers” (1990, p. 82).

There are a number of agreed-upon concepts surrounding the LD definition. Firstly they have generally focused on two key (identifying) factors: exclusion and discrepancy. LD is not attributed primarily to other disorders (exclusion) such as intellectual impairment (mental retardation as referred to in US), emotional disturbance, cultural difference, environmental disadvantage, economic disadvantage, sensory impairment or insufficient instruction (Dickman, 2005; Fletcher et al., 2007; Hallahan & Mercer, 2002; Hallahan & Mock, 2003; Kavale et al., 2006; Lyon, 2003; Turkington & Harris, 2003). There is also a discrepancy between a child’s aptitude (intelligence) and his or her achievement level, thus creating an unexpected underachievement (Dickman, 2005; Johnson et al., 2005; Kavale et al., 2006; Lyon, 2003; Smith, 2004; Smith & Adams, 2006; Turkington & Harris, 2003).

Secondly, it is also agreed that LD is not just one single disorder. Many agree that there are numerous forms of LD which can include problems with language (receptive/expressive), reading (basic reading, comprehension, problems with syntax or grammar, difficulties with phonics), writing (problems with sentence structure, writing mechanics and organisation, spelling), mathematics (calculation, reasoning, math facts or concepts, and number reversals), cognitive (processing new skills, following directions, difficulties memorising), motor (may have fine/gross motor skill problems), organisation (following a schedule and time), social (may misinterpret non-verbal social cues, social isolation) and attention (distractible, short attention
Thirdly, learning disabilities are intrinsic to the individual. They are presumed to be related to a deficit in the neurological functioning of the child. They do not disappear over time, however, may range in expression and severity at different life stages (Fletcher, Coulter, Reschly & Vaughn, 2004; Hallahan & Mercer, 2002; NJCLD, 1998).

Today, even though there is no universally accepted definition, one definition written by the National Joint Committee on Learning Disabilities (NJCLD) is recognised as one of the most favoured definitions (Hallahan & Mock, 2003; Kavale & Forness, 2000; Sideridis, 2007). The definition, even though it has been updated in regards to terminology used, has been around since it was first introduced in 1988. The NJCLD defined learning disabilities as:

A general term that refers to a heterogeneous group of disorders manifested by significant difficulties in acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical skills. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self-regulatory behaviours, social perception, and social interaction may exist with learning disabilities but do not, by themselves, constitute a learning disability. Although learning disabilities may occur concomitantly with other disabilities (i.e., sensory impairment, mental retardation, serious emotional disturbance), or with extrinsic influences (such as cultural differences, insufficient or inappropriate instruction), they are not the result of those conditions or influences. (NJCLD, 1998, p. 1)

Through this period, though, further solidification in defining LD came about. However, part of what made this period turbulent and continues to do so today was the concern about identification procedures (Fletcher et al., 2007; Johnson et al., 2005; Klassen, Neufield & Munro, 2005).
2.2.2.3 Identifying LD

Although many now agree (somewhat) on the understanding of what LD is, identifying those with LD has become an even greater battlefield. There is at least one central issue that has occupied the LD literature since the end of the twentieth century. That issue pertains to the argument of discrepancy between aptitude (intelligence) and achievement. By the 1990s many were using the discrepancy method as part of their identification process (Hallahan & Mercer, 2002). Since then, it has been widely criticised by researchers and experts in the field (Hallahan, Keller, Martinez, Byrd, Gelman & Fan, 2007; Kavale et al., 2006; Klassen, 2002; Reschly, 2005; Stuebing, Fletcher, LeDoux, Lyon, Shaywitz & Shaywitz, 2002; Townsend, 2006). One of the major flaws in this identification approach is that it promotes a ‘wait-to-fail’ policy (Townsend 2006). This is due to the fact that a significant discrepancy between IQ and achievement is hard to detect under the age of about eight. Often, schools do not identify a child as learning disabled until they are performing well below the age-expected level, generally in Year three or four of primary school (Foorman, Francis, Shaywitz, Shaywitz & Fletcher, 1997). Research and experts have shown that by the time children are identified as LD by this method they are likely to have already experienced three to four years of failure, causing problems of lower self-esteem, motivation and expectations (Townsend, 2006). This in turn draws them further and further behind other students. Some researchers have likened this concept to the ‘Matthew effect’ where better readers learn more about their world and read more than students who experience failure (Siegel, 1989). Thus, the earlier students are identified, the earlier intervention can begin, and the more effective it will be (Steele, 2004; NJCLD, 2007). This argument is supported by research showing that early intervention brings the greatest possible chance of closing the gap between these students (Ashman & Elkins, 2002; Elkins, 2007; Mann, McCartney & Park, 2007).

Other issues surrounding the discrepancy debate include: concerns regarding universal cut-offs between the discrepancy of IQ scores and achievement levels which would identify a child with LD (for example, from a clinical view, a child in one school may be identified as LD, however, in another school may not be, due to the differences in the measure of discrepancy used [Lyon, 1996]); an achievement difficulty and absence of exclusions does not necessarily mean that the child has a neurobiological
disorder (Lyon, Fletcher & Barnes, 2002; Vellutino Scanlon & Jaccard, 2003); and, the exclusionary element of LD has led to under-identification or misdiagnosis of individuals who come from poverty, or minority backgrounds (Hallahan & Mercer, 2002; Turkington & Harris., 2003).

Researchers are now beginning to explore alternative approaches to the discrepancy approach to identification (Fletcher et al., 2007). Many of the new alternatives share three essential components: the need to specify low achievement, identify exclusionary factors, and measure response to instruction (Fletcher et al., 2004). These new alternative identification approaches are still centred on the current definitions of LD, such as the one proposed by the NJCLD, and aim to identify students as early as possible so that intervention and support can begin at an early age. However, many of these new alternative approaches are in early stages of development and have not been refined.

2.2.2.4 Current Trends in Australia

The American LD movement has been extremely influential within the states of Australia. Australia’s legislative system has a three-tier system of government (national / federal, state, and local government). The federal government is a bicameral structure comprised of an upper house (Senate) and a lower house (House of Representatives). The federal government has responsibility for funding independent (non-government) schools, catering for approximately one third of Australia’s children (Graham & Bailey, 2007). The state or territory is responsible for funding the public (government) schools, policy, and curriculum issues for their own state (second tier of government).

Each state therefore defines disability slightly differently. State definitions of disability take a categorical approach having set criteria for each category (Parliament of Australia Senate, 2002). Table 2.1 shows that although these vary between states and territories they all include intellectual, sensory, and physical disabilities.
<table>
<thead>
<tr>
<th>State</th>
<th>Disability Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Education (NSW)</td>
<td>Sensory impairment, intellectual, physical and psychological functioning and language disorders</td>
</tr>
<tr>
<td>Education Queensland</td>
<td>Physical impairment, speech-language impairment, hearing impairment, intellectual impairment, visual impairment and autism spectrum disorder</td>
</tr>
<tr>
<td>Department of Education and Training (Vic)</td>
<td>Physical disabilities, severe language disorder, severe emotional disorder, hearing impairment, intellectual disability, visual impairment and autism spectrum disorder</td>
</tr>
<tr>
<td>Department of Education (Tas)</td>
<td>Vision impairment, deafness and hearing impairment, autism, intellectual disability, physical disability, psychiatric disorder, and multiple disabilities.</td>
</tr>
<tr>
<td>Department of Education (WA)</td>
<td>Autism, intellectual, hearing, visual, language and physical disabilities</td>
</tr>
<tr>
<td>Department of Education and Children’s Services (SA)</td>
<td>Physical, intellectual or sensory impairments and/or disabilities in communication, multiple disabilities</td>
</tr>
<tr>
<td>Department of Employment, Education and Training (NT)</td>
<td>Intellectual, sensory, physical, social/emotional, language/communication disability, a specific learning disability or multiple disabilities</td>
</tr>
<tr>
<td>Department of Education and Community Services (ACT)</td>
<td>Sensory, physical, psychological, intellectual, communication disorder, severe disturbed behaviour, multiple disabilities</td>
</tr>
</tbody>
</table>
As can be seen in Table 2.1, only the Department of Employment, Education, and Training in the Northern Territory have identified and categorised LD (specific learning disability) for support. Other states (such as Queensland, Tasmania, and South Australia) identify and define LD, although support generally is through the use of support programs used for students with learning difficulties. Finally, some states (such as New South Wales) do not distinguish between LD and learning difficulties (Parliament of Australia Senate, 2002). Thus, within Australia, the term ‘learning difficulty’ as opposed to ‘learning disability’ is generally used (Elkins, 2007; Graham & Bailey, 2007; Scott, 2004). As well as the characteristics discussed earlier of students with LD, students included within this category also include “those experiencing poverty, non-English speaking background, isolated students, indigenous students, and others experiencing undue difficulty in learning for reasons that may be unclear” (Elkins, 2002, p. 14). The focus is on supporting all students who struggle with literacy, and supporting students who are experiencing educational disadvantage. Definitions used within several of the states (as discussed) are extremely broad (broader than the American). They generally do not distinguish between learning difficulties and learning disabilities, and have been criticised for lack of specificity (Scott, 2004). Within New South Wales (NSW) even though there is considerable support in the literature for the term ‘learning disability’, and it is accepted by many experts, organisations and researchers in the field, the Department of Education and Training (DET) does not support using the term within schools. A parliamentary paper titled ‘Foundations for Learning: A New Vision for New South Wales’ in 2002 reported that the DET in NSW “does not support the term ‘learning disability’ to describe children who have ongoing problems with areas of the curriculum such as literacy and numeracy” (2002, p. 60). The DET in NSW states that the focus needs to be on the cause and “what we can do about it… [There is] a very strongly held perspective across Australia that we need to not label children; that we need to look at a functional approach in terms of focusing on the difference we can make to their learning” (DET, 2001, cited in New South Wales Parliament Legislative Council 2002, p. 60).

The Australian Learning Disability Association (ALDA) was established in 2001 to support those with LD. The reason was due to the lack of understanding and support services available in Australia for people with LD. ALDA argue that there is a lack of
public and professional understanding, awareness and acceptance of LD nationally (ALDA, 2002). In a proposal to the ‘Senate Employment, Workplace Relations and Education References Committee’, ALDA argued that there urgently needed to be a nationally recognised and accepted definition of LD (ALDA, 2002). They argued that there is a lack of understanding of LD amongst policy makers and practitioners, which is due to there being no differentiation between the terms ‘learning disabilities’ and ‘learning difficulty’ (ALDA, 2002). Due to this, there appears to be no consistent approach to defining, assessing and identifying those with a learning disability across Australia, thus impacting upon the quality of teaching and meeting the needs of these students (ALDA, 2002). Graham and Bailey (2007) state that although there is some support at the federal, state, and school level “there is no formal classification of LD, no assurance of individualised education programs (IEPs), and no special provisions targeted to follow up a diagnosis” (p. 389). The terms ‘learning difficulty’ and ‘learning disability’ across Australia are often used interchangeably and understood to mean the same thing. Yet, the differences in how Australia generally defines ‘learning difficulties’ and how the US and the rest of the world define ‘learning disabilities’ clearly show that they are not the same (Scott, 2004). Across Australia definitions of ‘learning difficulty’ are far broader than the definitions of ‘learning disability’ (discussed earlier). This has resulted in unrest within Australia between LD advocates (such as ALDA and AUSPELD) and policy makers and practitioners in understanding, identifying and supporting students with learning disabilities. As an AUSPELD representative told the Parliament of Australia Senate Committee:

The difficulty [of the present approach] is that it conflates difficulties in learning that are produced by extrinsic factors – that is, things like poor schooling, absence from school, emotional problems and sensory problems – with intrinsic factors such as dyslexia when we know there are biochemical and physiological differences between people who are dyslexic and people who have no reading problems. So the issue of definition is important from our point of view because the treatment implications will be different depending on how you define the problem. (Parliament of Australia Senate, 2002, p. 67)

LD needs to be seen as a separate term to learning difficulties. Unlike students who have learning difficulties, LD is a lifelong disability. Thus, approaches to support
students with learning difficulties (which may evaporate over time) and approaches to support students with LD (lifelong) will be different (ALDA, 2002). Advocates for LD have argued that LD needs to be defined as a specific disability, because of the mismanagement, misdiagnosis, and, lack of awareness and understanding of the real nature of LD in the education sector (ALDA, 2002; New South Wales Parliament Legislative Council, 2002). This study focuses on those who have a deficit in the neurological functioning that does not disappear over time (learning disability), and that their significant difficulties are not the result of extrinsic influences (learning difficulties). Therefore throughout the remainder of this study the term learning disability (LD) will be used rather than learning difficulty.

2.2.3 Prevalence of LD

The real prevalence of learning disabilities is subject to much dispute due to the lack of agreed-upon definition and identification of LD (Fletcher et al., 2007; Kavale et al., 2006; Sideridis, 2007; Townsend, 2006). For example, the more stringent the identification criteria, the lower the prevalence will be (Lerner, 1985). Estimates vary, ranging from 1-30% of the school population. Figures from studies have generally hovered around the 5-10% mark for those with LD within schools (Vaughn & Fuchs, 2003). Within Australia surveys have generally found that 20% of students are thought to fit within the term ‘learning difficulties’ (Graham & Bailey, 2007). Until the definition and identification dispute can be resolved the accuracy and validity of prevalence of learning disabilities will always remain questionable.

2.3 ATtribuTion theoRY

Having investigated and discussed some of the issues and problems that have occurred in the developmental debates about LD, other areas also appear to influence the issues surrounding students with LD. For example, a person’s belief system and others’ perceptions and beliefs about students with LD, and relationships in conjunction with their impact on academic achievement have been found to influence
the actions and reactions of a child with LD. As the movement towards inclusion continues, and many more students regarded as having special educational needs are being identified as having a LD, the understanding, beliefs and expectations that teachers have towards students is critically important.

This argument is reinforced by research literature in the area of LD. Clark for instance argues “the way in which general education teachers perceive the achievement of children with learning disabilities in comparison to that of their non-disabled peers is of great significance” (1997, p. 69). Consequently, the relationship between the teachers’ understanding and perceptions of students with LD, and how they respond to these students is important if any changes are to occur in how teachers perceive and understand them, and develop expectations of their ability in an inclusive classroom.

Attribution theory provides a useful theoretical framework for this. Before examining how attribution theory may shed light on these issues, a review of the principles of the theory, dimensions included in the theory, the linkage of dimensions of attributions to expectancy beliefs, and, the relationship between the attributional model and achievement-related behaviour, will be discussed.

**2.3.1 Some Important Principles of Attribution Theory**

An attribution refers to the “perceived cause of an outcome; it is a person’s explanation of why a particular event turned out as it did” (Seifert, 2004, p. 138). Explanations as to why someone passed or failed an exam, or won or lost a game provide examples of this notion. Attribution theory is a term given to various theories that deal with clarifying causal perception (Bar-Tal, 1978). In other words, ‘attribution’ is a term that is related to the perception of an individual about the causes of his or her own or another person’s behaviour. In 1925 Fritz Heider while completing his PhD became interested in attributions. He was particularly interested in the reasons that people gave for their own successes and failures. He believed that everyone had an innate interest and need to understand and control their environments. Heider carried out an experiment which included his subjects observing an animated film of shapes moving about the screen. Subjects were asked to report on
what had been observed. From his findings, Heider termed the way in which individuals functioned and responded as ‘naïve psychologists’ who develop causal explanations for significant events (Heider & Simmel, 1944). Heider published the findings in 1944, which stimulated much research in the area, marking him as the father of attribution theory.

Heider’s proposed theory was developed by Bernard Weiner and colleagues from the 1970s onwards, and is now the theoretical framework used in current attribution research. Weiner’s model of achievement-related behaviour deals with causal perception of success and failure. Weiner’s (1985, 1986) research relating attributions to students’ behaviours and successes in an academic environment has done much to further knowledge and understanding of how attributions relate to learning in school (Linnenbrink & Pintrich, 2002). Weiner presented two attribution theories of motivation. Firstly, Weiner presented a model which included what he termed ‘intrapersonal theory’ which addresses how individuals explain their own successes and failures and find out reasons why. The second model Weiner presented was termed ‘interpersonal theory’ which addresses how individuals explain other peoples’ successes and failures and find out reasons why (Tollefson, 2000). In other words in an educational context, attribution theory can be used to evaluate how students perceive the behaviour of themselves, and how teachers perceive the behaviour of the students. These are then used for future predictions and expectations as well as responses to the causes.

### 2.3.1.1 Self Perceptions

Attribution theory (Weiner, 1980, 1992) is one of the most influential contemporary theories with implications for academic motivation. Attribution theory incorporates behaviour modification in the sense that it emphasizes the idea that learners are strongly motivated by the outcome of being able to feel good (or bad) about themselves and others. It incorporates cognitive theory and self-efficacy theory (which will be discussed later) in the sense that it emphasizes that learners' current self-perceptions will strongly influence the ways in which they will interpret the
success or failure of their current efforts and hence their future tendency to perform these same behaviours (Stipek, 2002).

2.3.1.2 Process Underlying an Attribution

There is considered to be a three-stage process underlying an attribution. Firstly, the behaviour of a person has to occur and be observed. In regards to perceiving or observing a person’s behaviour Heider proposed two distinct descriptions: ‘phenomenal description’ which is the nature of contact between the person and the environment (which is directly experienced by the person); and, ‘causal description’ which analyses the underlying conditions that give rise to the perceptual/observed experience (Heider, 1958). The second stage is where the perceiver/observer has to make a judgement as to whether the behaviour observed is deliberate. That is, the person must decide whether the behaviour was intentionally performed. The final stage is where the observer makes an attributional trait (which will be further discussed). Thus, the perceiver/observer assigns the reason for the behaviour, whether the person observed was forced to perform the behaviour (in which case the cause was attributed to outside external factors) or not (in which case the cause is attributed to within the person observed) (Heider, 1958).

2.3.1.3 Factors Relating to Attribution Theory

There are many different behavioural causes (factors) that are attributed to perceived outcomes. According to researchers, the main behavioural causes are ability, effort, luck, and task difficulty (Foll, Rascle & Higgins, 2008; Holschuh, Nist & Olejnik, 2001; Schunk, Pintrich & Meece, 2008; Stipek, 2002; Weiner, 1979, 1986; Yan & Li, 2008). However, other causes may include teacher, mood, health, fatigue and many more (Weiner, 1986, 1992). The behavioural cause that has been assigned as the reason for the outcome will have many implications. For example, depending upon the cause given for a behavioural outcome, different responses in regards to behaviours and future expectations from the individual person and observers will
result. Thus, matching the correct cause to the performance and outcome is vital. Each behavioural performance (whether a successful or failed outcome resulted) is measured along different dimensions. It is these causal dimensions that have the psychological force to influence expectancies, emotions, self-efficacy beliefs, affects and actual behaviours (Schunk et al., 2008).

2.3.2 Motivational Dimensions in Attribution Theory

The motivational push of attributions in the theory, originates from a classification along dimensions based on an analysis of the individual’s causal structure. These dimensions have implications for an individual’s expectancy beliefs, emotions, and motivated behaviours (Schunk et al., 2008). Attribution for success and failure was initially expanded from social learning theory (which will be discussed in due course) by Rotter (1966) to include a one-dimensional classification of causality: locus of control. The main features regarding the dimension are whether the perceived behaviour was internal or external to the individual. The basic distinction between causes that are internal and external correspond to the main question in attribution theory in regards to the relative personal factors or influence of environmental factors on an individual’s behaviour (Rotter, 1966). If outcomes were believed to result from the individual’s own behaviour then it would be classified as an ‘internal locus of control’. On the other hand, if outcomes were believed to result from the influence of the environment then it would be classified as an ‘external locus of control’ (Schunk et al., 2008).

Weiner took what Rotter (1966) and Heider (1958) had developed and proposed a new direction regarding the motivational dimension of attribution theory. Weiner first proposed that what Rotter had termed ‘locus of control’ was in fact an internal-external classification of causality (Weiner, 1979). Whereas in Rotter’s theory the locus of control was focusing on control of future outcomes, Weiner claimed that the ‘locus’ was in fact conceived as a backward-looking belief (cause) and therefore renamed the term ‘locus of causality’ (Weiner, 1979). Weiner also proposed that as well as having only one motivational dimension ‘locus of causality’ (locus of control),
the locus and control needed to be separated. Weiner postulated that different internal causes can result in different responses and future predictions of individuals (Stipek, 2002). For example, Weiner claimed that two distinctly different internal causes of success or failure, such as effort and ability, will determine very different results. A student failing due to lack of ability will respond very differently and have very different future expectations than a student failing due to lack of effort. Even though both causes are internal, different responses result due to the belief that people think that they can control effort but not ability (Schunk et al., 2008). Weiner proposed from this that a second dimension needed to be included which he termed ‘controllability’.

The controllability dimension refers to how much control a person has over a cause. For example, causes can be internal and controllable (such as effort) or uncontrollable (such as ability). External causes can also be uncontrollable (such as luck). However, there is some debate as to whether external causes can be controllable. For example, Hareli & Hess (2008) suggested that an external cause is not under that person’s control. Weiner (1986) on the other hand argued that there may be external causes that are not controllable by the individual, but are controllable by others (such as teacher bias). Another dimensional term that occasionally appears in the empirical literature, which was first incorporated by Rosenbaum in 1972, is ‘intentionality’ (Weiner, 1979). Rosenbaum explained this as having volitional control, which implies the extent of stability. However, Weiner claims that it does not refer to a cause per se, as even though people or acts are intentional, a cause is not considered intentional (Weiner, 1986). Weiner suggested that ‘intentionality’ be subsumed within the controllability dimension.

Weiner also proposed that a third dimension be included in the attribution dimensional continuum, namely ‘stability’ (Weiner, 1979). Weiner claimed that the stability dimension defines “causes on a stable (invariant) versus unstable (variant) continuum” (1979, p. 6). In other words, the attribution is a consistent trait of the person or a temporary state. For example, causes can be stable (such as ability) and unstable (such as effort). Stable causes are more likely to be permanent fixtures in future predictions as opposed to unstable causes. In other words, students who fail in class due to a stable cause are more likely to predict future failing. Alternatively,
students who fail in class due to an unstable cause are less likely to predict future failing. Therefore, according to Weiner’s model, causes of achievement-related behaviour theoretically can be located within one of eight categories (two levels of locus, by two levels of controllability, by two levels of stability).

### 2.3.3 Relationship between the Attributional Model and Achievement-Related Behaviour

Each of these three dimensions of causality has both a primary psychological function and a number of secondary effects. According to Weiner (1979) attribution theory is captured by emotions. These emotions (secondary effects), combined with “expectancy beliefs, can be used to predict choice, persistence, and achievement behaviour” (Schunk et al., 2008, p. 104).

In relation to these secondary effects, the locus of causation dimension links to feelings of pride. The locus of causation dimension can build or break a person’s self-esteem or self-worth (Weiner, 1994) if the cause is within the individual. For example, a cause that is within an individual such as ability that resulted in success will produce an emotional feeling of pride, and an increase in self-esteem. Alternatively, a cause within an individual such as ability that resulted in failure will produce an emotional feeling of humility, and a decrease in self-esteem.

The dimension of controllability and emotions focuses on personal reactions experienced by individuals as they react to their own performances, and the effect experienced by individuals as they evaluate or react to others’ performances. In terms of personal reactions of individuals about their own performances, the research suggests that personal controllability is associated with shame and guilt-related emotions (Weiner, 1986). If a cause is seen as controllable, the individual is deemed responsible, whereas uncontrollable causes generate a perception of less personal responsibility for the outcome (Weiner, 1994). For example, if students fail an exam and the cause is uncontrollable (such as ability), they are likely to feel embarrassed and shamed by the failure. This in turn could lead the student into future avoidance of
work and adversely affect future performances. Alternatively, if students fail an exam and the cause is controllable (such as effort), they are likely to feel guilty. In terms of reactions made to other individuals for their performance, if the individual’s performance is seen as controllable, the observers are likely to feel a sense of anger and frustration (negative emotional behaviours) towards them. Alternatively, they may feel a sense of pity or sympathy (positive emotional behaviours) if the cause is seen as uncontrollable.

Finally, the dimension of stability affects individuals’ future expectations and can result in helplessness and helpfulness. In regards to future expectations, individuals who succeed through a stable cause (for example, ability) are likely to create future expectations of success, and feel greater optimism for the future. Alternatively, those who fail through a stable cause (such as lack of ability) are likely to create future expectations of failure, and feel greater helplessness for the future.

These linkages among the dimensions of an attribution, the emotions experienced, and the subsequent behaviours can help us understand student and teacher affects and behaviours.

2.4 AN ATTRIBUTIONAL APPROACH TO ACHIEVEMENT OUTCOMES

Attribution theory offers a useful framework for exploring teachers’ responses to students’ academic outcomes, such as success or failure. The attributional principles discussed earlier can be applied either by individual students (self-directed) trying to understand their own behaviour and outcomes or by others such as teachers trying to analyse and understand a student’s performance in the classroom in order to increase their academic achievements (Peterson & Schreiber, 2006; Weiner, 1979, 1986).

Ways in which teachers perceive reasons behind student behaviour and achievement in any given context are vitally important as they can influence teacher expectancies, which in turn affect student performance in the classroom (Woolfson, Grant &
Campbell, 2007). If a student fails a test and attributes the result to lack of ability, and the teacher perceived the student as low in ability then both will assume behaviours that will reinforce those beliefs (Bennett & Bennett, 1994). A teacher will often in these situations be sympathetic towards the student (Weiner, 1985). Conversely, if the teacher perceived the student to be high in ability and failed due to lack of effort then they would show more anger toward the student (Graham, 1990). Thus, it is important to understand how and in what way teachers perceive students’ (particularly with LD) behaviour and achievement, and how it can impact upon the student in regards to their own perceptions and beliefs in themselves and future achievement outcomes.

### 2.4.1 Attributions Teachers Have About Students

As discussed earlier, attribution theory is particularly useful when individuals experience negative or unexpected outcomes (such as failure). Teachers often use causal attributions when searching for reasons (causes) for these negative or unexpected outcomes (Clark, 1997). When teachers try to determine the cause for the student’s failure, they often use their prior knowledge about the student (Kelley & Michaela, 1980). The main causes that are often determined by teachers include the student’s ability, effort, mood or task difficulty, with ability and effort being dominant (Fall et al., 2008; Yan & Li, 2008).

When teachers attempt to determine the cause of failure, often they search for the cause within the individual (internal locus of causality), hence the main causes include ability and effort. By identifying the cause of failure as within the individual, teachers do not have to expend emotional energy in self-examination. In other words, teachers are then not held responsible for the student’s failure (Major, Kaiser & McCoy, 2003). When teachers impugn the lack of effort as the reason for failure, they deem the student personally responsible for such failure (Matteucci & Gosling, 2004; Matteucci, 2007).

Studies have found that teachers feel more responsible and guilty for the failure of high-ability students than they do for low-ability students (Bennett & Bennett, 1994;
Matteucci, 2007). They also found that teachers do not feel responsible for students who do not expend much effort into their work. These reactions were found due to the student’s low ability or other causes outside the teacher’s influence (Bennett & Bennett, 1994). On the other hand, some teachers (often highly motivated or highly efficacious teachers) question and search for alternative (true) answers to the causes of the student’s failure, and thus, threaten and question their own schema (Helsing, 2007).

As well as attributing the causal dimensions of student failure, teachers also determine the cause of student success. Often when students succeed (more often when they are low achievers or failures), they are attributed to the teacher as having input into the success (Bennett & Bennett, 1994). This was particularly so in Rolison and Medway’s (1985) study where they found some evidence that showed teachers were more likely to attribute success among students with special educational needs to their own efforts rather than to those of the students. However, they tended to attribute the failures to the students rather than to themselves. Thus teachers feel pride and responsibility for students’ success, yet, attribute students’ failure to the students where the teacher is not responsible for the student (Rolison & Medway, 1985).

The expectations that teachers create from the attributions that they make about students failing or succeeding can affect the way in which they respond and behave towards students (Reyna, 2000; Schunk et al., 2008).

2.4.2 How Teacher Attribution Affects Actions toward Students

Studies on classroom observations have consistently shown that teachers rarely give direct comments on students’ poor performances. Instead, teachers respond in a variety of indirect ways that require interpretation (Schunk et al., 2008). Individuals’ beliefs and perceptions about the causes of events can be changed through feedback and other environmental manipulations (Linnenbrink & Pintrich, 2002). Teacher feedback can indirectly strongly influence students and their attributions to causes and
future expectations. Feedback given by teachers mainly stresses the effort that students expend, and ability of the students (Schunk et al., 2008).

Research has generally suggested that when teachers give feedback to students they tend to be more sympathetic to a student who performed poorly due to lack of ability rather than effort. Alternatively teachers generally show more anger towards a student who performed poorly due to lack of effort rather than ability (Georgiou, Christou, Stavrinides & Panaoura, 2002; Graham & Weiner, 1986; Peterson & Schreiber, 2006). Graham and Weiner (1986) established a link between teachers’ positive and negative feedback and their anger or sympathy towards a student. They found that anger and sympathy were the first responses teachers showed following a negative outcome in the classroom. Teachers showed greater anger towards a student who performed poorly in class due to lack of effort. This was due to teachers perceiving the outcome to be within the student’s control. Alternatively, Graham and Weiner found that teachers showed greater sympathy towards a student who poorly performed in class due to lack of ability. This was due to teachers perceiving the situation as uncontrollable by the student (1986).

Following the teacher giving positive and negative feedback, and showing their sympathetic or angry emotions towards students, the consequences were correlated. For example, Weiner and Kukla (1970) gave an evaluative feedback sheet for psychology students (assuming the role of teachers) to complete which included hypothetical students failing a class test. The hypothetical students varied in ability and effort. Participants were asked to assign rewards and punishments that they deemed appropriate to students. In their findings, the students that had low ability and expended low effort received less punishment than those students who had high ability and expended low effort. Moreover, Weiner and Kukla found that those students who had low ability and expended high effort received greater reward than those students who had high ability and expended high effort.

As Clark (1997) pointed out, as well as these teacher attributions and expectations, and the importance of understanding how teachers respond to them, it is equally important to understand how students interpret the response that they receive from their teachers.
2.4.3 Attributional Messages and Student Performance

Teachers’ expectations and beliefs about individual students are considered to influence students’ motivation and performance (Florea, 2007). Students often base their attributions for success and failure on cues from the classroom teacher about their own personal competence (Clark, 1997). Research has consistently shown that teachers are likely to experience emotions of anger or sympathy following students’ performances in the classroom, which are based on their expectations of students (Juvonen, 2000; Reyna, 2000; Reyna & Weiner, 2001; Stipek, 2002). Students can often interpret anger by the teacher as a reflection of higher expectations of the student. Often the teacher implies that the outcome was in the control of the student, which in turn, implies that the student has high ability. Alternatively, students can often interpret sympathy by the teacher as a reflection of lower expectations of the student. Often the teacher implies that the outcome was out of the control of the student, which in turn, implies that the student is of low ability (Clark, 1997; Graham, 1984; Graham, Doubleday & Guarino, 1984; Juvonen, 2000; Reyna, 2000; Reyna & Weiner, 2001). In other words, when teachers show an underlying display of anger, they demonstrate the belief that the student is capable of changing his or her behaviour, and, thus can change the outcome (Bruning, Schraw, Norby & Ronning, 2004). The display of sympathy on the other hand, has demonstrated the belief that the student is not capable of changing his or her behaviour, and, thus not able to change the outcome (Bruning et al., 2004).

As well as teachers demonstrating emotions as a consequence of negative outcomes (such as failure), studies (Bruning et al., 2004; Schunk et al., 2008) have shown that teacher reactions to successful outcomes also have an impact on students. For example, praise following success on easy tasks can infer low ability expectations upon students. On the other hand, absence of praise following success on easy tasks can infer higher ability expectations upon students (Schunk et al., 2008). Even though praising student success has positive intentions by teachers, praise can often be an
indicator of a low ability expectation if not used accurately and properly (Bruning et al., 2004).

The type of feedback given to students is therefore important. Schunk (1983, 1984, 1989) found that feedback given by teachers that emphasised ability rather than effort resulted in higher levels of student self-efficacy which is consistent with attribution theory. Foote (1999) followed on from Schunk’s findings and observed teachers’ feedback statements. Foote analysed the statements in relation to how they might affect numerous education variables from the attribution theory perspective. Foote found that the most effective types of feedback in regards to student motivation were positive ability feedback and negative effort feedback. Foote found that positive feedback from success that focused on ability built students’ self-efficacy and motivation. On the other hand negative feedback from failure or poor performance that focused on effort did not diminish the students’ self-efficacy or their motivation, as it promoted future expectations that the cause was unstable and could change within the student’s control. Thus, expectation of future success is possible. Depressingly though, these types of feedback were the least used in the classroom (Foote, 1999).

As well as teachers’ emotional responses and feedback, consequences that follow actions also convey to students an expectation and attribution. For example, Reyna and Weiner’s (1998, cited in Reyna, 2000) study of secondary school teachers found that the teachers were more likely to reward students following failure (such as through encouragement; more willingness to offer help; offer tutoring; make-up work) due to the belief that students failed because of uncontrollable factors. Alternatively, they found that teachers were more likely to punish a student following failure (such as through detentions) due to the belief that students failed because of controllable factors. This study supports similar findings of other studies in that students interpret attributions from teachers’ reactions. That is, the students view teachers who punish students for poor performance as an indicator of high ability. The students perceive the punishment as an indication that the teacher believes the outcome can be controlled by the student. Thus, as a result future outcomes are therefore expected to improve. On the other hand, students view teachers who reward students for failure or poor performance as an indicator of low ability. The students perceive the reward as
an indication that the teacher believes the outcome cannot be controlled by the student. Thus, as a result, future outcomes are not expected to change (Juvonen, 2000; Nesbit & Burton, 2006; Reyna & Weiner, 2001; Stipek, 2002; Weiner, 1980).

Although the above discussions have reported about students in general, of all ages, specific studies focusing on the cognitive development of children have resulted in varied findings. For example Weiner, Graham, Stern and Lawson (1982) gave students from 5-11 years of age scenarios describing a teacher responding to a failing student with sympathy or anger. Participants were asked to determine the reason why the teacher thought that the student had failed. Their findings concluded that all students decided that teacher anger related to lack of effort. However, interestingly, only students from nine years of age onwards reported that sympathy was believed to be related to low ability. This finding was supported by further studies (Hattie & Timperley, 2007; Lam, Yim & Ng, 2008; Tollefson, 2000). In particular Dickhauser and Meyer (2006) found that primary age children (8-9 year olds) detected teacher expectations from their feedback. In particular the girls detected the teacher’s feedback as lower than that of boys and that in spite of the intention not to cause harm, teachers may subtly and unknowingly convey their expectations to the students (2006).

Thus, it can be generally agreed that young children may perceive ability as developing through effort and learning, and attribute success to effort rather than ability (Lam et al., 2008). However, from around nine years of age (Year four) children can determine the differences between uncontrollable and stable (such as ability), and controllable and unstable (such as effort) attributes perceived by the classroom teacher through emotional and feedback responses to behavioural outcomes. This in turn can affect students’ performances (Hattie & Timperley, 2007). If teachers possess different expectations towards their students’ academic achievements and students are aware of these expectations, and this in turn impacts upon students’ achievement, then according to Carr and Kurts-Costes (1994), it is important to assess the accuracy of these teacher perceptions. Carr and Kurts-Costes (1994) worked with Year three teachers and six of their students who they deemed of high, medium and low maths ability. The children completed a number of questionnaires on metacognitive knowledge, self-concept, and attributional beliefs.
Teachers also completed questionnaires which asked for their judgment of each child’s metacognitive abilities, academic self-concept, and attributional beliefs about the reasons underlying academic success and failure. Their findings indicate that teachers’ perceptions were biased by children’s abilities, as the higher ability students were portrayed more favourably on all variables. Their findings indicate that teachers rely heavily on achievement levels to estimate children’s metacognitive abilities, self-concept beliefs and attributional beliefs (Carr & Kurts-Costes, 1994).

Stereotyping of students can result from inaccurate judgements and perceptions of students’ academic abilities and by relying heavily on achievement levels. Stereotypes, according to Reyna, “are an unconscious vehicle for causal ascriptions that may inadvertently affect the amount of blame, and thus the amount of assistance, offered to students who come from groups stereotypically labelled as lazy or troublesome” (2000, p. 96-97). Students with LD are often stereotyped, and studies have shown that teachers have strong negative misconceptions of students with LD (Turkington & Harris, 2003). These will be discussed. However, prior to discussing these issues, it is important to discuss the academic achievement and attributions of students with LD.

2.4.4 Academic Achievement of Students with LD

Students generally associate themselves with a ‘positive attribution style’, which, Jacobson, Lowery and DuCette (1986) termed the ‘normal self-esteem attribution’. In this case students attribute success more internally (internal and controllable/uncontrollable cause), and failure more externally (external and uncontrollable cause). Thus when students succeed due to internal controllable/uncontrollable traits, such as effort and ability, they gain higher self-esteem, higher motivation and have future expectations for success.

Research has shown, on the other hand, that students with LD generally associate themselves with a ‘negative attribution style’ (Waheeda & Grainger, 2002). Students with LD often attribute success more externally (external and uncontrollable cause),
and failure more internally (internal and uncontrollable cause) (Reid & Lienemann, 2006; Waheeda & Grainger, 2002). Consequently, when students succeed they tend to attribute it to external influences such as luck, and others’ help (Nunez, Gonzalez-Pumariaga & Gonzalez-Pienda, 1995). Moreover, when students with LD fail they are more likely to attribute it to such causes as lack of ability. This reduces their self-esteem, decreases their motivation and creates future expectations of failure (Reid & Lienemann, 2006; Waheeda & Grainger, 2002).

However research in this area has not always been consensual. For example, other studies have found that students attribute successes and failures to external causes (Hallahan, Kauffman & Lloyd, 1999; Heiman, 2006). This way students often view their lives as being controlled by external forces, thus, have given up responsibility (especially academic ones) for their actions (Mamlin, Harris & Case, 2001). For example, Heiman’s (2006) study of 191 students with LD and 190 without LD, found that students with LD reflect success and failure as external causes. On the other hand Heiman’s study found that students without LD reflect success to internal factors (2006). Whether students with LD attribute causes as internal or external for success and failure, one can conclude from the research that students with LD, when confronted with difficulty, are more likely than their peers to attribute the difficulty to insufficient uncontrollable traits (Heiman, 2006; Reid & Lienemann, 2006). Logically it can also be argued that students with LD therefore are less likely to attribute failure to sufficient controllable traits (Waheeda & Grainger, 2002).

Research of this nature has led researchers to conclude that children with LD tend to manifest what Nunez, Gonzalez-Pienda, Gonzalez-Pumariega, Roces, Alvarez, Gonzalez, Cabanach, Valle and Rodriguez (2005) termed a ‘maladaptive attributional style’. This includes students having low ability achievement expectations, low persistence at school tasks, and low academic self-concept (Gans, Kenny & Ghany, 2003; Nunez et al., 2005; Stone & May, 2002).

However, not all findings have conclusively pointed in the same direction in regards to self-concept. Another group of studies found that there were no differences in self-concept between students with and without LD (Bear, Minke, Griffin & Deemer, 1998; Dyson, 2003; Meltzer & Montague, 2001).
Taken as a whole, research generally supports the notion that students with LD are likely to develop a set of beliefs that can have detrimental implications for their future achievements (Heiman, 2006). The suggestion to teach students with LD to attribute their failures to external uncontrollable traits, and successes to internal traits (positive attributional style) may be appealing. Often repeated failures by students with LD may cause them to create maladaptive beliefs that can then create problems that go beyond their initial disability. As the literature has suggested, in order to extricate the student with LD from this vicious cycle, educators must not just focus on remediation for their academic deficits, but provide these students with successful experiences. Educators also need to directly alter their own manipulative attributional beliefs that they hold concerning students with LD (Lackaye & Margalit, 2006).

2.4.5 Teacher Attribution and LD as a Cause for Failure

Before teachers can make such changes and extricate students with LD from this vicious cycle, they need to firstly believe in the students and have a clear understanding of students with LD and what their academic abilities and potential towards achievement are. Unless teachers can accurately perceive and evaluate the abilities of these children they are likely to add to their problems. Research has shown that teachers misunderstand students with LD, and judge students more on the LD label than the attributions, characteristics and needs of these students (Lackaye & Margalit, 2006; Tournaki, 2003).

Many expectations towards ‘types’ of students emanate from stereotypes about certain groups of students (Arceneaux, 2006). Stereotyping students with LD through the label that is attached to them represents “a host of pre-packaged expectations that have very real consequences for the beliefs and behaviours of both the user of stereotypes and for those being stereotyped” (Reyna, 2000, p. 86). Most stereotypes of labels, such as LD, convey internal, stable and uncontrollable causes to teachers (Hastings, Hewes & Witting, 1996; Tournaki, 2003; Weiner, 1993). Weiner (1993) discussed the “sin versus sick” dilemma. He stated that there are certain causes in life
that are under the label ‘sickness’ (such as disability) and other causes in life that are under the label ‘sins’ (such as drug abuse). Those that are under the label ‘sickness’ are often conceptualised as causes that are internal to the individual, stable and uncontrollable. Those that are under the label ‘sins’ are often conceptualised as causes that are internal to the individual, unstable and controllable. Society often responds to those who are labelled as ‘sickness’ with sympathy and less anger, rewarding at higher frequency levels and punishing at lower frequency levels (Weiner, 1993). On the other hand, those labelled as ‘sins’ are often responded to by society as less sympathetic (more angry), and seeing them as more worthy of punishment than reward (Weiner, 1993).

Due to its label, LD can often be seen as rooted in the traditional medical model of disability. Often LD is viewed as a condition that needs diagnosis that is centred within the child rather than the educational environment (Doris, 1993). Clark (1997), using Weiner’s attributional model, proposed that educators viewed LD as an internal, stable and uncontrollable condition, which Weiner termed ‘sickness’. If this was so, Clark proposed that educators held low expectations for students with LD, showing higher reward, lower anger, higher sympathy, and higher expectations for future failure by these students (Clark, 1997). Clark’s research surveyed primary school teachers using eight vignettes each describing a hypothetical boy who had just taken a typical classroom test and failed. The vignettes each gave a statement of student ability, the typical pattern of effort expended by the student in the classroom, and additional information on academic performance identifying four of the boys as learning disabled and four as non-learning disabled. The boys were matched on ability (high or low), on typical effort (high or low), and on presence or absence of a learning disability (LD or NLD). The vignettes, however, did not specify the reason for the hypothetical boys’ failures. This was intentional, so as to stimulate causal thinking on the part of the participants.

Clark’s hypothesis was conclusive in that teachers did respond with the belief that students with LD would fail more than those without LD; they deserve more sympathy and less anger than those without LD; and, should be rewarded more and punished less than those without LD (1997). Clark concluded that the attributional message teachers send out to students with LD is that they are less competent than
their peers without LD and should expect to achieve less as a result (1997). This study supported similar findings by Tollefson and Chen (1988), and has since been supported by Georgiou and colleagues (2002). Tournaki (2003) also supported Clark’s study and found that teachers predicted greater academic success when the student was reading below average level without a label attached than those with the LD label attached to them.

Stereotyping students using labels such as lazy, troublesome or unachievable provides an unconscious vehicle for causal ascriptions that may affect the blame and amount of assistance offered to such students. Even minimally stigmatising students can have an expectancy effect among them (Banks & Woolfson, 2008). When stereotyping LD as an internal, stable and uncontrollable condition, teachers are inadvertently affecting students’ own beliefs about the cause of their behaviour and achievements. This can have, as the research discussed earlier shows, dire consequences for the child’s subsequent motivation and performances in school (Ellis, 2002). By forming such teacher judgments about students with LD, students may eventually be neglected and denied opportunities to improve their ability (Reyna & Weiner, 1998, cited in Reyna, 2000). This can cause them to suffer feelings of shame, lowered self-esteem, and over time to withdraw more from tasks (Reyna, 2000; Valas, 1999). Withdrawing from the tasks, may however enable students to attribute their failure to lack of effort, rather than lack of ability. Thus, attributing failure to internal, controllable and unstable traits will likely prevent them from having their self-esteem reduced even more and from feelings of shame.

There is often a discrepancy found between ratings that teachers give to students with LD and self-ratings given by students with LD about themselves. Teachers have been found to rate students with LD as weak and below average in regards to their academic performances and work (Banks & Woolfson, 2008). Moreover, teachers would judge low-achieving students with LD more negatively than low-achieving students without LD (Meltzer, Katzir, Miller, Reddy & Roditi, 2004). On the other hand, students with LD perceive themselves as capable and effective, and rate themselves academically as average to above-average. Thus, students with LD rate themselves higher than teachers judge them to be (Banks & Woolfson, 2008). Addison’s (1997) study supported earlier work by McLoughlin, Clark, Mauck and
Petrosko (1987) and found similar ratings when he studied parents’ and special education teachers’ perceptions of adolescents with LD. He found that there were similar ratings between parents and special education teachers, yet found significantly lower ratings between parents’ and adolescents’ ratings. Differences in ratings between students with LD and teachers and parents can be due to a number of inconclusive reasons. One of the reasons could be due to students with LD having inflated views of their performance for a number of protective (attributional) reasons (Meltzer et al., 2004). Alternatively, teachers may have low expectations of students with LD because of the stereotypical label that is worn by those students (Meltzer et al., 2004).

The argument that stereotyping students with LD may negatively affect teacher expectations and attitudes which may in turn negatively affect student self beliefs and performance is not a new one. It has also been documented in relation to students without LD. In the 1960s, for example, Robert Rosenthal carried out a study using laboratory experimenters and rats. Half of the experimenters were informed that their rats were intelligent, while the other half were informed that their rats were dull (even though they were randomly selected). At the end of the study the experimenters had to assess and report back on their rats’ performance. As Rosenthal had hypothesised, those who were informed that their rats were intelligent had higher expectations of the rats, and thus reports showed that the intelligent rats performed better than the dull rats (Rosenthal & Lawson, 1964). From this initial experiment Rosenthal then worked with a school principal (Lenore Jacobson), in what would now be termed a world-famous experiment. Rosenthal and Jacobson (1968) randomly selected a number of students and informed their teachers at the beginning of the year that they would be ‘late bloomers’ who would show surprising gains during the academic year. At the end of the year those students that the teachers expected to show significant gains did so. Rosenthal and Jacobson concluded from their experiment that the teachers’ expectations towards their students actually created self-fulfilling prophecies. This, they christened the “Pygmalion effect”.

Although, Rosenthal and Jacobson’s study is well respected and documented, there have been questions and criticisms of their study, such as logical and methodological problems (Mitman & Snow, 1985). Studies have tried to replicate Rosenthal and
Jacobson’s experiment, but results have been mixed (Anderson & Rosenthal, 1968; Chaikin, Sigler & Derlega, 1974; Meichenbaum, Bowers & Ross, 1969; Mittman & Snow, 1985). Though there is a weak (and at times disputable) correlation between positive teacher expectations (having higher expectations for success) and student achievement, there seems to be a stronger consensus amongst expectancy researchers that the effect teachers’ expectancies have on students is more likely to be a negative one (Brophy, 1985). A teacher’s low expectations can have what researchers have called a “Golem effect” (Eccles & Wigfield, 1985) lowering students’ own expectations for themselves. This unfortunately, according to Eccles and Wigfield, is not only more frequent, but also more powerful than the initial “Pygmalion effect” (1985).

Sadly, from the discussions above one could hypothesise that the “Golem effect” could have direct relevance for students with LD. If students with LD are at far greater risk of failing and not achieving, then their futures are unlikely to be prosperous or productive. Rosenblatt and Rosenblatt observed that “success in school provides the foundation for a productive future for children and adolescents” (1999, p. 21). Academic achievement has been termed the ‘premier outcome of schooling’ (Shriner 1994) which relates to the experiences by students throughout school. Yet in identifying and supporting students with LD it is the low achievement that differentiates students with LD from those without (Fletcher et al., 2007). If students with LD do not have belief in their ability to achieve and succeed in education then future prospects can be devastating. As Westwood has put it: “until we truly understand the ‘affective consequences’ of learning failure (McKissock, 2001) our actions to prevent such damaging occurrences for the children in our own class settings will always be half-hearted and inadequate” (2004, p. 188-189). Attribution theory can have major influences over this. Attribution theory also has roots within the expectancy-value theory of motivation (Atkinson, 1964; Weiner, 1972).
2.5 EXPECTANCY-VALUE THEORIES OF MOTIVATION

Weiner’s attribution model branched off from the original expectancy-value theory created by Atkinson (1957). Weiner was a former student of Atkinson and has always acknowledged connecting his attribution model to Atkinson’s framework (Eccles & Wigfield, 2002). Whereas attribution theory is concerned with beliefs about the causes of achievement outcomes (looking back at what caused the behaviour to occur), expectancy-value theory focuses on expectations for success (looking forward at what behaviour will likely occur).

Atkinson (1957) originally formed the expectancy-value theory and his primary goal was to be able to predict the individual’s attitudes toward objects and actions. Atkinson originally conceptualised achievement behaviour as a conflict between a tendency to approach and avoid tasks (Stipek, 2002). According to Atkinson (1957), any achievement-related activity is believed to include positive and negative emotional motives. That is, all achievement-related activities will incorporate hope for success and fear of failure. How the person behaves, according to Atkinson (1964), is determined by the strength of these emotional motives. In other words, whether the person’s hope for success ($MS$) is higher or lower than their fear of failure ($MAF$) will determine how they respond and behave. These emotional motives Atkinson (1964) termed as unconscious variables.

He also believed that achievement-related behaviour is influenced by conscious variables about people’s beliefs of particular situations. In regards to people directing themselves to a particular achievement-behaviour, Atkinson believed that probability ($Ps$) of success (ability) and probability ($Pf$) of failure (lack of ability) would influence their decision. For example, if a child believed that they did not have the ability to succeed in the activity, that would affect their motivation to succeed. A child who believed that they did have the ability to achieve would more likely be motivated to approach the activity. A second conscious variable Atkinson included into the equation was the value people placed on success (pride) ($Is$) and failure (shame) ($If$). For example, a child who succeeds at an activity that was deemed difficult, will feel pride in what they have achieved and will likely be motivated to try. Alternatively, a
child who fails at an activity that was deemed easy, will feel shame and embarrassment and will likely be unmotivated to try.

As anticipated pride and shame is determined entirely by the perceived probability of success and failure, Atkinson (1964) concluded that the tendency to approach a task is determined by one unconscious stable factor (hope for success) and two conscious factors (probability of success and value placed on success). The tendency to avoid a task is determined by one unconscious stable factor (fear of failure) and two conscious factors (probability of failure and value of failure). He created a formula to represent the psychological laws that he proposed:

\[ TA = (MS \times Ps \times Is) - (MAF \times Pf \times If) \]

The resultant tendency to either approach or avoid \( TA \) an activity can range from \(+1\) to \(-1\). If the equation results positively, the child is more likely to approach the task. Alternatively, if the equation results negatively, the child is more likely to avoid the task (Atkinson, 1964). In other words, high task value will result in students being involved more in their learning, and as they gain control of their learning beliefs, their expectations for success are likely to be higher (Pintrich, Smith, Garcia & McKeachie, 1991). Also as the value which children place on the task increases, so will their motivation to pursue it (Pintrich & Schunk, 2002). Conversely, the lower their expectation for success and/or value on an activity, the lower their motivation is likely to be to approach the activity (Pintrich & Schunk, 2002).

Even though Atkinson’s model of expectancy-value theory was pioneering, it has since been criticised (Eccles & Wigfield, 1995; Stipek, 2002; Wigfield & Eccles, 1992). For example, the two unconscious variables in Atkinson’s model (hope for success and avoidance of failure) are seen as very difficult to measure and can only be measured indirectly (Stipek, 2002). Secondly, the importance of the task in relation to the effort (and loss) that will be required to carry out the activity also needs to be considered (Eccles & Wigfield, 1995, 2002). For example, a child may choose not to continue with a course because he or she perceives that the costs in terms of effort required are far too great. Moreover, if this course requires too much effort and study time, it takes time away from other activities (such as socialising, sports etc.). This
then places more or less value towards the activity, and in turn affects their motivation to approach the activity (Wigfield & Eccles, 1992).

Using Atkinson’s original model, more recent cognitive theorists have developed models that have greater relevance to classroom practice (Battle, 1965, 1966; Eccles, 1987; Eccles, Adler, Futterman, Goff, Kaczala, Meece & Midgley, 1983; Feather, 1988; Wigfield & Eccles, 1992, 2002). These models have expanded the original theory by Atkinson and have further discussed how individuals’ expectancies for success mediate their motivation and achievement in educational settings (Wigfield, 1994). The model of expectancy-value theory that has generated the most research on academic achievement in the classroom setting is from Eccles, Wigfield and their colleagues (Schunk et al., 2008). The two most important predictors of achievement behaviour in their model, like in Atkinson’s model, are expectancy and task value. One of the major differences that Wigfield and Eccles (1992) included in the model was the inclusion of the cost of engaging in the task. Wigfield and Eccles (1992) termed this ‘cost belief’ in their model. This is defined as the perceived negative aspects of engaging in the task (Wigfield & Eccles, 1992). Discussed as one of the weaknesses and criticisms to Atkinson’s original model, Wigfield and Eccles considered the possibility that often when individuals engage in a task, it usually means that they cannot engage in other tasks at the same time. Thus with the choice of one particular task, Wigfield and Eccles believed that often there are some costs associated with it (1992).

There has been very little research on students with diverse needs and abilities, and even less (if any) in regards to students with LD, within the expectancy-value theoretical framework. However, Borders, Earlywine and Huey (2004) have recently studied students with behaviour difficulties in relation to the expectancy-value theory. Part of the conclusion from their findings was that students with low perceived competence and academic expectancies could possibly see little reason to choose working in class over misbehaving. They stated that by increasing students’ academic expectations, and by having students come to expect that academic achievement produces benefits, they may start to see value in the class work rather than alternatives to work. This could relate to students with LD who may, more than likely, keep trying and working hard in class.
2.6 ATTITUDES TOWARD STUDENTS WITH LD

As identified earlier in this chapter, other significant influences on students’ performance and achievements in the classroom are their teachers’ attitudes and beliefs (Ashman & Elkins, 2002; Brooks, 2006; Forlin, Loreman, Sharma & Earle, 2007; Winter, 2006). For example, research has shown that negative attitudes can lead to low expectations of a person (Brooks, 2006; Campbell, Gilmore & Cuskelly, 2003; Idol, 2006; Palmer, 2006). On the other hand, positive attitudes can lead to higher expectations of a person (Angelides, 2008).

The influence of teacher attitudes is powerful. For example, negative attitudes and low expectations by teachers can result in reduced opportunities for students to learn. This, in turn, can further impair students’ self beliefs causing them to lower their expectations. When this occurs on a continuing basis it can result in the development of a deficit cycle (Westwood, 1995). On the other hand, positive attitudes can often lead to greater opportunities for students to learn, which may enhance their performances and ultimately heighten self expectations. This is also likely to result in higher self-esteem (Brooks, 2006; Idol, 2006; Palmer, 2006; Woolfson, Grant & Campbell, 2007).

Therefore in order for inclusion to be successful and for students (particularly those with LD) to achieve to their fullest, it is critical that teachers and school personnel have positive attitudes towards students (Angelidis, 2008; Barco, 2007; Silva & Morgado, 2004; Winter, 2006).

2.6.1 Role of Beliefs

Over the past 40 years, research has found that teacher beliefs and attitudes are correlated to their behaviours and actions towards students in the classroom (Barco, 2007; Brooks, 2006; Idol, 2006; Kniveton, 2004; Palmer, 2006; Woolfson et al.,
2007). Woolfson and colleagues (2007) claimed that the connection between teacher beliefs and their behaviours in the classroom are linked to personally-based beliefs, values and principles. Brooks (2006) suggested that the beliefs teachers have are stable and resistant to change over time.

2.6.2 Factors Influencing Teachers’ and Preservice Teachers’ Attitudes toward Students with Special Educational Needs

Over the past few decades the notion of inclusion has gained more momentum and the majority of classrooms now include students with diverse needs and abilities. When inclusion (also known as ‘mainstreaming’) was more sporadic and was beginning to gain momentum, teachers’ attitudes towards students with diverse needs and abilities (at the time described as disabilities) were not very positive (Bacon & Schulz, 1991; Houck, 1992; Lobosco & Newman, 1992; Siegel, 1992). Teachers were very apprehensive about these students and the quality of work that they were capable of producing. In particular, empirical data by Aloia, Maxwell and Aloia (1981) showed that teachers possessed low academic expectations in relation to students with special educational needs. They were also concerned about their lack of knowledge and training for inclusion of students with disabilities (Bender, 1985; Siegel & Jausovec, 1994).

However, more recently, studies have suggested that there has been a move towards more positive attitudes towards students with diverse needs and abilities. For example, a study by Fields (2006) surveyed general education teachers enrolled in an in-service course in special education at a regional university in Queensland. The teachers in the study were presented with 14 case study descriptions of students with varying characteristics, behaviours and special needs in the form of vignettes. They were asked questions in response to the vignettes presented. Part of the results indicated that teachers were more hostile towards including students with behavioural disorders than those who are gifted and talented or have communication disorders. The study is consistent with previous studies (such as Soodak, Podell & Lehman, 1998) which found that teachers had more positive attitudes towards students with social and
physical disabilities than academic or behavioural. Avramidis and Norwich (2002) reviewed a large body of research which explored a host of possible factors that impact upon teacher attitude and acceptance of inclusion between 1984 and 2000. Their findings revealed that teachers’ attitudes towards students with disabilities in inclusive settings have become more positive over recent years. More specifically, they found that not only were teachers more receptive to including students with sensory and physical impairments than those with LD but that general education teachers were less encouraging, showed less tolerance and understanding towards students with LD than did special educators. Avramidis and Norwich concluded from their study that there is an inconsistency in regards to positive attitude towards full inclusion for students with disabilities (2002). These results have since been supported by Cavusculu (2006), Lancaster and Bain (2007), and Romi and Leyser (2006).

Further research exists supporting the notion that teachers have preferences when accepting students with different types of disabilities (Avramidis & Norwich, 2002). For example, Loreman and colleagues (2005) found that teachers were mixed in their attitudes towards students with diverse needs and abilities with the least positive response towards students with behaviour, and particularly physically aggressive behaviour problems. Moreover, Alghazo and Gaad (2004), and Englebrecht and colleagues (2003), concluded from their studies that teachers found students with an intellectual disability as being more difficult to support than students with other types of disabilities. Dupoux, Wolman and Estrada (2005) compared the attitudes of teachers toward inclusion of students with diverse needs and abilities in Haïti and the United States. One hundred-fifty-two high school teachers in Haïti and 216 high school teachers in the United States completed the Opinions Relative to the Integration of Students with Disabilities Scale (Antonak & Larrivee, 1995). The researchers concluded that teachers in both countries created a hierarchy of attitudes when accommodating the severity of disabilities. They found that students with LD engendered the most positive attitudes towards accommodating their needs while those with emotional and behavioural difficulties caused the least positive attitudes towards accommodating their needs. Avramidis, Bayliss and Burden (2000) found that while the majority of teachers agreed with the inclusion policy, most were only willing to accept the inclusion of students with mild disabilities. As DeSimone and
Parmar (2006) have stated, research thus far has shown that elementary and middle school teachers generally do not feel responsible for differentiating instruction to meet diverse learning needs. Thus the research suggests that modifying and differentiating instruction is not a skill that comes easily for any teacher (novice or experienced).

Even though the attitude over time has, to some degree, become more positive, and the severity and disability type can often impact upon the teachers’ attitude towards students, the relationship between teacher attitude, and behaviour and instructional practice has become more evident (Brooks, 2006; Woolfson et al., 2007). Studies done by the European Agency for Development in Special Needs Education (2003), and Leung and Liu (2003), have demonstrated that pedagogy is affected by teacher attitudes and belief. Research has also shown that there are correlations between negative attitudes and poor or ineffective instructional strategies (Avramidis & Norwich, 2002; Brooks, 2006; Idol, 2006; Kniveton, 2004; Palmer, 2006). Biddle (2006) investigated the types of instructional strategies that general education teachers used in inclusive classrooms. Eighty-nine general education teachers (teaching Years 9-12) completed a self-evaluation of instructional strategies they used in their inclusive classrooms. They also completed questionnaires concerning their attitudes towards inclusion of students with diverse needs and abilities. Biddle found that teachers who were more positive in their attitude towards inclusion of students with diverse needs and abilities utilised effective instructional strategies more consistently than those teachers who had a more negative attitude. Moreover, the more exposure and experience teachers have with students with disabilities, the more positive their attitude towards them would be (Lambe & Bones, 2006). This claim supported a previous study by Hastings and colleagues (1996) who found that preservice teachers’ experiences with students with specific learning disabilities had more of an impact on their attitudes and perceptions than those who had little or no previous experience.

The principle that more exposure to and experience with students with special educational needs brings about a more positive attitude towards them, supports earlier studies. That is, the importance of increased experience and contact with students with special educational needs in conjunction with knowledge and training, would bring about more positive attitudes (Brooks, 2006; Lambe & Bones, 2006; Sharma, Forlin, Loreman & Earle, 2006; Winter, 2006). Moreover, research has shown that teachers’
negative attitudes towards students with special educational needs are a function of lack of training and development (Brooks, 2006). Thus one could expect that teachers with more training about students with special educational needs may have less negative attitudes and higher favourable attitudes and emotional reactions towards these students (Avramidis et al., 2000; Beh-Pajooh, 1992; Carroll, Forlin & Jobling, 2003; Mungai & Thornburg, 2002; Shimman, 1990).

Given the arguments it is indeed disappointing that even today teacher education programs are still criticised for doing too little to prepare preservice teachers to work with children with special educational needs. Several studies have found that attempts to improve preservice teachers’ attitudes have only had a small impact upon changes to attitudes (Brown, Walsh, Hill & Cipko, 2008; Forlin et al., 2007; Tait & Purdie, 2000).

Winter (2006) asked 203 teachers in Northern Ireland about their professional training in preparing them to meet the challenges of inclusive education. Winter found that 89% did not feel their training had prepared them. DeSimone and Parmar (2006) conducted a study in 19 states across the United States and concluded that respondents (75%) were not prepared enough to meet the needs of their students with special educational needs. These findings are consistent with findings from Bradshaw and Mundia (2006), and, Subban and Sharma (2006), which show that the majority of their respondents claimed that their preservice teacher training programs did not equip them with the necessary skills to face the challenges and difficulties of teaching students with LD.

Moreover, researchers have also concluded that special education courses have little (if any) impact on changing perceptions and attitudes towards students with special educational needs (Brown et al., 2008; Stella, Forlin & Lan, 2007). For example, Stella, Forlin and Lan (2007) studied 213 preservice teachers in Hong Kong who completed pre- and post-surveys on a compulsory special education module. This was to compare their attitudes and concerns towards inclusive education. They found that although the results were significant, the differences in attitudes and concerns from completing the compulsory special education module were not substantial. This supported earlier research by Forlin and colleagues (1999) who had previously found
that those preservice teachers who had taken an elective subject in special education as part of their course indicated less discomfort and more positive attitudes than those who had not done so. However, Forlin and colleagues found that compulsory special education subjects had minimal impact upon influencing preservice teachers’ attitudes and beliefs (1999). Conversely, Ellins and Porter (2005) found that training in special education was found to enhance the formation of positive attitudes.

Additionally, it has been claimed that preservice teachers’ pre-existing beliefs and past school experiences are powerful in shaping conceptions and knowledge about teaching diverse students (Flores & Day, 2006; Pop, 2008), which is unlikely to change over time (Bandura, 1977). This then perpetuates the importance of preservice teacher training years. However, as Bradshaw and Mundia (2006), and Subban, and Sharma (2006) indicate preservice teacher training programs do not change preservice teachers’ preconceptions about teaching students with diverse needs and abilities.

2.6.3 Teachers’ and Preservice Teachers’ Attitudes toward Students with LD

There has been limited research to date on teachers’ attitudes towards students with LD, although the little that has been done points towards teachers not always responding positively to having students with LD within inclusive classrooms (Tait & Purdie, 2000). The majority of research which looks at teacher attitudes of students with LD refers to students as having intellectual disability and a variety of other definitions of LD (as discussed earlier). There has been even less research that specifically looks at preservice teachers’ attitudes and beliefs toward students with LD.

DeSimone and Parmar (2006) examined teacher beliefs where 228 Year six, seven and eight mathematics teachers completed the ‘Survey on Teaching Mathematics to Students with Learning Disabilities’ across 19 states in the United States. They followed this up with telephone interviews from 26 of the respondents who completed the survey. One of their striking, yet disappointing, findings was that the majority of
respondents did not see any distinction between a student with LD and a low-performing student. Consequently, the respondents believed that the modifications that they used for low-achieving students were adequate and sufficient for students with LD (DeSimone & Parmar, 2006).

DeSimone and Parmar’s study supports previous work, such as that of Siperstein and Goding (1985) who concluded that there is a strong misconception of students with LD among teachers. They hypothesised from this that teachers have low expectations of children with LD. This can in turn manifest into teachers’ different treatment of children with LD. Siperstein and Goding (1985) contended that teachers’ responses to children with LD were triggered more by the label that they wore than their actual behaviour.

Westwood (1995) who has done a vast amount of work in the area of LD asked 311 teachers in South Australia about the causes of difficulties students with LD have in school learning. His findings reveal that factors within the student were the main cause mentioned (62%). Family background and culture were mentioned by 14% of the respondents. However, only 8% of respondents claimed that it was due to factors within the curriculum. Kataoka, Kraayenoord and Elkins in 2004 compared Australian and Japanese teachers and found that Australian teachers believed that the causes were within the student. On the other hand they found that Japanese teachers perceived the causes as within themselves (as teachers) and the curriculum (Kataoka et al., 2004). As Australian teachers saw the causes of difficulties for students with LD being within the student (Kataoka et al., 2004), this could be a possible reason as to why Ashman (1984) found that teachers had more negative attitudes towards students with specific learning disabilities (SLD) than towards students without SLD.

In contrast, McIntosh and colleagues (1993) found that teachers had similar attitudes to students with and students without LD. Their overall findings indicate that students with LD were treated by their teachers similarly to everyone else. On the one side they concluded that students were accepted by teachers in the same way as others were, completing the same work and using the same material as the others in the class. On the other side they claimed that the classes were not differentiated to meet the needs of students with LD. Their final conclusion was that even those teachers that
were identified as expert teachers made few adaptations to meet students’ needs (McIntosh et al., 1993).

2.6.4 Attitude Summary

The attitude of teachers towards students with diverse needs and abilities appears to be related to their belief in their ability as a teacher to teach these students successfully (Brooks, 2006; Lancaster & Bain, 2007). Lancaster and Bain (2007) concluded that those teachers who felt more confident in having the ability to teach students with disabilities were reported to have been more willing to have them in the class.

Numerous studies have also been completed on teachers’ attitudes and their beliefs about their abilities to teach students with diverse needs and abilities (teacher self-efficacy), and the relationship that the attitudes and beliefs share towards the success of inclusion (Palmer, 2006; Sharma et al., 2006; Winter, 2006; Woolfson, Grant & Campbell, 2007). Teacher attitude has been found to be a major contributing factor in teachers’ beliefs about their abilities to teach students with diverse needs and abilities. Past research, by Brownell and Pajares (1999), Jordan, Stanovich, and Roach (1997), and VanReusen, Shoho, and Barker (2000), that focuses on attitudes and beliefs about teacher abilities of general education teachers in primary and secondary schools toward inclusion, have highlighted positive results. That is, the more positive teachers’ attitudes and beliefs are about their abilities to teach students with diverse needs, the more positive and successful they are in teaching within an inclusive classroom environment. For example, Brownell and Pajares (1999) conducted a study on attitudes and beliefs of primary school teachers toward inclusion. Their aim was to try to find a correlation between the attitudes, teacher beliefs and professional teacher training. They concluded that general education teachers with positive attitudes and beliefs in their teaching abilities, along with proper training, are likely to be more willing to include students with special educational needs in an inclusive classroom. They found that when both training and beliefs in their abilities were strong, they usually had positive attitudes towards students with special educational needs.
(Brownell & Pajares, 1999). These conclusions have since been supported by Brooks (2006), Lambe and Bones (2006), and Lancaster and Bain (2007). Winter (2006) reiterated this notion from her findings that teachers with positive attitudes, a strong belief in their ability to teach diverse students successfully, along with proper training, have the skills to be effective teachers within inclusive settings.

From the research findings discussed, one can argue that the attitudes and beliefs of teachers are mostly although not all learned and appear to be influenced by the amount of training and knowledge they have received (Brooks, 2006; Burke & Sutherland, 2004; VanReusen et al., 2000; Winter, 2006). However, researchers have concluded that the most important and effective factors related to teachers’ attitudes were exposure and experience with students with special educational needs (Brown et al., 2008; Lambe & Bones, 2006; Richards & Clough, 2004). These impacted not only upon teachers’ attitudes towards students, but also the belief in their ability to teach students successfully. This is termed ‘teacher efficacy’.

### 2.7 SOCIAL COGNITIVE THEORY

Similar to Weiner’s attribution theory and Atkinson’s expectancy-value theory, social cognitive theory, proposed by Albert Bandura, also emphasises beliefs as the direct cause of behaviour. For all of these theoretical models, changes in behaviour are assumed to require changes in cognition. However, each of the theories deviate from one another in regards to the particular beliefs that they emphasize. Weiner’s attribution theory is concerned with beliefs about the causes of achievement outcomes (thus focuses on the past causes of behaviour). Atkinson’s expectancy-value theory, on the other hand, focuses on the expectations for success (thus looks at the future expectations of behaviour). Moreover, Bandura’s social cognitive theory focuses on self-efficacy (which considers previous attributional experiences and also future valued expectations).

Thus, according to the key assumption underlying Bandura’s social cognitive theory children develop socially through the processes of modelling (from others) and the
kinds of reactions and reinforcements they receive to their behaviour (1977). The main domain in social cognitive theory is that of social influences on behaviour. Social cognitive theorists and researchers believe that people acquire their knowledge, skills, beliefs, strategies and emotions by observing other people. People also learn about the appropriateness of modelled actions by observing their consequences (Stipek, 2002). It contends that individuals act, based on their thoughts, goals, beliefs and values (Stipek, 2002).

2.7.1 Some Important Principles of Social Cognitive Theory

Some of the main components of social cognitive theory that apply to this study include vicarious learning, personal agency, self efficacy, and teacher efficacy. In regards to vicarious learning, Bandura and Walters (1963) proposed that people present behaviours that have resulted from observing other people being reinforced for the behaviour. Bandura carried out a study in 1965 where three groups of children were shown (each group with a different version) a short video of aggressive behaviour by a child using toys to throw and hit a doll. One group of children observed the child in the video being rewarded for the aggressive behaviour towards the doll. Another group of children observed the child being punished for the aggressive behaviour towards the doll. The final group of children observed the child receiving no feedback for the aggressive behaviour. After the children observed the short video, they were secretly filmed in a room that contained the same toys that were shown in the video. Bandura and Walters found that the group of children who saw the video of the child being rewarded for the aggressive behaviour were most likely to carry out the aggressive behaviour. On the other hand, the group of children who saw the child being punished were least likely to carry out the aggressive behaviour. The group that saw no response for the behaviour were in between the two groups in regards to their behavioural response. Bandura and Walters concluded that the likelihood of them demonstrating the behaviour was a function of reinforcement the child had observed in the video and not of their previous personal experiences. Vicarious experiences therefore, according to Bandura and Walters, are what individuals undergo when they observe others performing tasks.
Bandura (1983) also claimed that people value self-satisfaction (intrinsic reward) more than material rewards (external reward). Thus, achieving personal goals and personal achievement standards results in self-satisfaction and serves effectively as reinforcement. Students creating their own goals and intentions can play a central role in social cognitive theory. When students create and commit to their own goals and intentions, they often feel a sense of satisfaction once they have achieved their desired goal. Bandura termed this as ‘personal agency’ (1983). Within the personal agency component, Bandura (1983) believed that symbols could help students achieve their desired goals. According to Bandura, using symbols (such as language) can provide individuals with a strong tool for dealing with the environment and their behaviour. For example, students in a class where the quieter ones go out to recess first, will more than likely result in some students being quiet in the future prior to recess (Stipek, 2002). The usage of symbols, and personal goals and achievement standards, can allow students to sustain effort over a longer period of time. As a result, students who aspire to their goals and achievement standards, keeping in mind the reward from achieving these, can continue to exert effort without the need of regular reinforcement (Bandura, 1983).

Within social cognitive theory, Bandura argued that how people answer the question ‘can I do this task?’ is a critical determinant in their behaviour. Bandura labelled this determinant ‘self-efficacy’ (Bandura, 1977, 1982, 1986, 1993, 1997). Self-efficacy is defined as “people’s judgments of their capabilities to organise and execute courses of action required to attain designated types of performances” (Bandura, 1986, p. 391). Choice of activities that individuals decide on, effort put into activities, and persistence to carry out and complete activities can all be affected by self-efficacy. Self-efficacy is strongly related to effort and task persistence (Bandura & Cervone, 1983). For example, a person with low self-efficacy for completing an activity is likely to avoid exerting effort in the face of difficulty. Those with high self-efficacy, on the other hand, are likely to exert effort in the face of difficulty and participate in the activity (Schunk et al., 2008).

As well as self-efficacy within the student, social cognitive theorists have also applied the notion of self-efficacy towards teaching. Several early studies by the Rand
Corporation applied Bandura’s theory to teaching and found that increases in individuals’ achievements were found to be strongly dependent on teachers’ sense of efficacy, concluding that teachers’ attitudes about their own professional competence have major effects on learning outcomes (Armor, Conroy-Oseguera, Cox, King, McDonnell, Pascal, Pauly & Zellman, 1976; Berman, McLaughlin, Bass, Pauly & Zellman, 1977). Thus, teacher efficacy has now become a major determinant focus within social cognitive theory.

2.7.1.1 Self-Efficacy Beliefs

As noted earlier, social cognitive theory focuses on self-efficacy (which considers previous attributional experiences and also future valued expectations). Bandura (1982) notes that behavioural and affective reactions by individuals differ, depending upon the level of self-efficacy and outcome expectations. What Bandura meant by outcome expectation is similar to the expectancy for success within the expectancy-value theory. Within the classroom, students would have efficacy judgments about their abilities to master the classroom tasks. However, they will also have expectations of the outcome of what they will achieve (such as grade) on the tasks (Bandura, 1986). It is generally perceived that the self-efficacy and outcome expectations are related to one another. That is, when a student’s self-efficacy is high, their outcome expectations are also high. However, it could be possible for a student to have high self-efficacy for a task, yet have a negative outcome expectation. For example, a student in a gifted class may feel efficacious for mastering the material in class, but hold negative outcome expectations about grades in class due to the high competition among the others in the class. Bandura suggested that a simple two (high/low self-efficacy) by two (high/low outcome expectation) comparison table would provide an insight into behaviour and affect (1982). For example, a student with high self-efficacy and high outcome expectation will have a high cognitive engagement; on the other hand, a student with low self-efficacy and low outcome expectation will more likely resign and withdraw from approaching an activity (Bandura, 1982). Although, outcome expectations and self-efficacy need not be related, the former often are dependent on the latter (Bandura, 1986).
2.7.1.2 How Self-Efficacy Beliefs are Formed

Bandura (1997) identified four phenomena that affect self-efficacy: mastery experiences, vicarious experiences, verbal persuasion, and physiological state. Mastery experience is “the interpreted result of one’s performance” (Pajares, 2007, p. 140). For example, a positive experience of a good performance on a test will influence the perception of one’s ability in that subject, and thus increase their self-efficacy. A negative experience of a poor performance on the other hand, will lower the perception of one’s ability in that subject, and thus lower their self-efficacy.

Vicarious experiences, as discussed briefly earlier, are observations of the experiences of others (Bandura & Walters, 1963). These observations and experiences involve students making social comparisons with others. This can in turn affect a student’s self-efficacy. For example, students who observe a model successfully perform in a threatening situation are more likely to develop the expectation that they can acquire the same skill (Alderman, 1999). Students can imitate their model’s skills, or copy the strategies that the model used (Wang, 2001). These vicarious experiences can lead to positive or negative behaviour, and can also increase or decrease a student’s self-efficacy.

Individuals also develop self-efficacy beliefs as a result of the verbal messages and social persuasions they receive from others (Pajares, 2007). These verbal persuasions, such as feedback, can motivate students to accomplish their tasks. However, Bandura (1997) did point out a concern that negative messages by teachers have an even greater effect on lowering a student’s efficacy expectations than positive messages do on increasing a student’s efficacy expectations. Thus, feedback given by teachers is critical and needs to be carefully given so that it does not reduce a student’s self-efficacy.

Finally, physiological states can affect a student’s self-efficacy, which in turn affects their performance. Physiological states, such as anxiety, nervousness, rapid heart rate, and sweating are symptoms that can often occur when learners face challenges that require competence to overcome (Pajares, 2007).
2.7.1.3 How Self-Efficacy Beliefs Influence Human Functioning

Although self-esteem has been studied in many facets, a number of educational psychologists have examined how the impact of self-efficacy relates to behaviour in primary and secondary school classrooms (Bru, 2006; Pintrich, 2000). High self-efficacy has been positively related to high levels of achievement and learning, higher levels of effort and increased persistence on difficult tasks (Bandura, 1997; Pintrich & Schunk, 2002). In other words, students with higher self-efficacy are more likely to work harder, persist with challenging tasks, and eventually achieve at higher levels, than students with a lower self-efficacy. Research has also shown that those with a higher self-efficacy are more likely to choose to continue to take more challenging courses and activities throughout schooling (Schunk & Meece, 2006).

This positive link between self-efficacy and achievement would suggest that self-efficacy should be as high as possible. The only concern with this theory is that although the aim is to have high self-efficacy beliefs, it is important that those self-efficacy beliefs are accurate (Bandura, 1997). For example, a child learning to swim should have self-efficacy beliefs that match their actual skills, or are a little higher than their actual skill level, but are not so overly positive that they attempt to swim out of their depth. In the latter case, serious injury could result from having overly positive beliefs about their capabilities. Therefore, within the classroom students should not overestimate or underestimate their capabilities. Rather, they should have accurate, but optimistic beliefs (Linnenbrink & Pintrich, 2002). Teachers therefore need to foster these positive, yet accurate self-efficacy beliefs to students.

2.7.2 Basic Concepts in Teachers’ Self-Efficacy

A student’s self-efficacy can be affected by the way teachers respond to students about their class work and behaviour. As discussed earlier, how teachers attribute a student’s class work and behaviour affects the way that they respond to a student
about the student’s class work and behaviour. This response can in return greatly affect a student’s self-esteem within the academic arena. As well as how teachers attribute a student’s class work and behaviour, teachers’ beliefs in their ability to motivate students and promote learning can also play a vital role in determining a student’s performance in the classroom, even more, perhaps, than student characteristics (Cheung, 2006; Woolfolk-Hoy & Spero, 2005). The beliefs teachers have about their own effectiveness are known as ‘teacher efficacy’ and underlie instructional decisions that they make which ultimately shape students’ educational experiences, and in turn affects academic achievement outcomes (Romi & Leyser, 2006).

When Berman and colleagues first studied teacher efficacy, they defined it as “the extent to which the teacher believes he or she has the capacity to affect student performance” (1977, p. 137). Since the studies in 1976 and 1977 by the Rand Corporation, the first major studies that followed were by Gibson and Dembo (1984), and Ashton and Webb (1986). They defined teacher efficacy as comprising two independent dimensions. Firstly, teachers had beliefs about their own personal ability to change and impact upon their students. This they termed ‘personal teacher efficacy’ (PTE). Secondly, teachers also had beliefs concerning the extent to which teaching can overcome external influences on the student. This they termed ‘general teacher efficacy’ (GTE). Tschannen-Moran and Woolfolk-Hoy, who have been major researchers in the area, defined teacher efficacy as a teacher’s “judgment of his or her capabilities to bring about desired outcomes of students’ engagement and learning, even among those students who may be difficult or unmotivated” (2001, p. 783). Throughout recent years, research has shown that these two dimensions (PTE and GTE) may differentially relate to preservice and practising teachers’ beliefs about control, management and motivation (Woolfolk & Hoy, 1990; Woolfolk, Rosoff & Hoy, 1990). For example, a teacher might have a high sense of personal teacher efficacy but lower general teacher efficacy if he or she believes that the home and environmental factors that are outside the teacher’s control have a greater impact on student learning than they do. On the other hand, a new teacher who feels overwhelmed and unprepared at times may believe that teachers in general can teach children effectively, but they personally lack the skills required to help students master the curriculum.
2.7.2.1 Development of Teacher Efficacy

Until the 1980’s, there had been little research focusing on the development of teacher efficacy from preservice training throughout a person’s teaching career. Of the research that has been conducted in this area, it has been suggested that GTE and PTE do change (differently from one another) over time and experience. For example, Hoy and Woolfolk (1993) looked at preservice teachers, prior to and after teaching experiences, as well as experienced teachers. Their findings supported an earlier study by Dembo and Gibson (1985) who found that PTE increased with years of teaching experience.

On the other hand, some researchers have indicated that GTE declines with experience. For example, Hoy and Woolfolk (1993) found that GTE decreased with years of teaching experience. These findings were also in line with Bandura’s (1993) findings that the GTE of practising teachers declined over a long period of time. These studies suggest that teaching experience has a positive effect on PTE and a negative effect on GTE. However, some researchers indicated that the level the teacher is teaching at would make a difference here. Other studies have reported higher teacher efficacy scores among primary teachers than secondary teachers (Greenwood, Olejnik & Parkay, 1990; Guskey, 1982; Parkey, Greenwood, Olejnik & Proller, 1988). However, it has been suggested these results may be misleading due to the primary teachers’ scores being recorded early in their teaching career (Ross, 1994).

Increasingly contemporary research studies have investigated the differences between preservice and practising teachers’ levels of efficacy. Some of these studies have confirmed that teacher efficacy is highest among preservice teachers and that this level of efficacy drops, often to a great extent, during the first year of teaching (Brousseau, Book & Byers, 1988; Soodak & Podell, 1997). Furthermore, efficacy levels continue to drop as experience is gained (Anderson, Greene & Loewen, 1988; Brousseau et al., 1988). In contrast, Soodak and Podell (1997) found that after the
initial drop in the first year of teaching, there was an increase in efficacy beliefs with experience, although the levels of efficacy never reached the same levels as during the preservice training. Moreover, Soodak and Podell (1997) found that these high changes in levels only occurred in primary teachers. De La Torre Cruz and Arios (2007) examined preservice teachers in their final year and in-service teachers who had been teaching for an average of fifteen years. They found that the experienced teachers had a higher teacher efficacy than preservice teachers.

Other researchers have found varying differences between preservice and practising teachers’ sense of efficacy. For example, Gorrell and Dhamadasa (1994) found that preservice and practising teachers had distinctly different levels of efficacy for different tasks. They found that preservice teachers had higher levels of efficacy for implementing new methods and techniques of instruction. On the other hand, practising teachers had higher levels of efficacy in classroom management and organisation. Yeo, Ang, Chang, Huan, and Quek (2008) found that Singapore teachers who had been teaching for five or more years reported stronger efficacy towards classroom management than their preservice counterparts.

2.7.2.2 Factors Affecting Teacher Efficacy

Teachers form beliefs about teaching and the classroom prior to training to become a teacher. People’s beliefs are formed throughout all schooling experience as a student. From years of experience as a student, people have made decisions regarding ‘good’ and ‘bad’ teachers (Pajares, 1992). One of the difficulties from this is that once a belief has been held for a long time, it becomes extremely difficult to change (Woolfolk-Hoy & Spero, 2005). Due to this, much of the literature and focus has been on preservice teachers, and creating a firm foundation for future beliefs and learning. The argument, therefore, is that if there is any opportunity to be able to change, and have the greatest impact in changing a teacher’s belief, then it is likely to be during the formative years of preservice training.
Professional development courses generally make an impact over the short term, usually immediately after the course, and gradually deteriorate back to prior to commencing the course (Fritz, Miller-Heyl, Kreutzer & Macphee, 1995; Ross, 1994). Interestingly research has shown that professional development courses impact more upon teachers with a high sense of teacher efficacy than those with a low sense of teacher efficacy (Fritz et al., 1995; Ross, 1994). This was due to those with a high sense of teacher efficacy being more likely to risk new procedures and to attempt the usage of the new training techniques in their classroom (Fritz et al., 1995).

### 2.8 THE INFLUENCE OF TEACHERS’ EFFICACY BELIEFS

There is evidence to suggest that teacher efficacy can adversely affect academic achievement for students, and teacher behaviours that can stem from their efficacy have been known to foster students’ academic achievement (Hoy, Tarter & Woolfolk-Hoy, 2006). Teacher efficacy has also been known to foster important student cognitions such as performance expectancies and appraisals (Caprara, Barbaranelli, Steca & Malone, 2006) and efficacy for achievement (Pajares, 1997). These can be done in a number of ways such as by talking with students about what can affect their learning, or discussing the instructional strategies that the teacher is using.

#### 2.8.1 Beliefs Concerning the Causes

Teachers’ beliefs about students’ ability (as discussed in the section on attribution theory) can also affect their teacher efficacy as well as their expectations about their students’ achievement potential (Stipek, 2002). Teachers, like students, can view ability in varied ways. For example, some will view ability as a fixed inherited trait that students (and teachers) can do little to change. Alternatively, some teachers will view ability as something that, through good teaching practices, can change. As such, teachers who view ability as a fixed inherited trait will believe that students’ ability will limit their potential for mastering the curriculum and may not believe that they can do much as a teacher to help them learn (Woolfson et al., 2007). Leyser (2002)
found that special education teachers score higher than general education teachers on
teacher efficacy. This could be due to special education teachers holding more
positive learner attributions (Leyser, 2002) and more positive attitudes. Woolfson and
colleagues found that special education teachers viewed ability as a more changeable
trait than general education teachers. Thus they concluded that special education
teachers had a higher teacher efficacy, and attributed less stability to learner
difficulties in performance and had higher expectations of students’ performances
(2007).

Moreover, the literature in this area has found a relationship between teacher efficacy
beliefs and teacher feedback given to students (Georgiou et al., 2002). For example,
Chester and Beaudin (1996) concluded that the comparison between teachers with
high and low teacher efficacy resulted in teachers with a higher teacher efficacy being
more likely to assist low-achieving students during failure situations. Furthermore,
they found that these teachers also critically praised students more and negatively
criticised them less than teachers with a low teacher efficacy.

2.8.2 Teacher Efficacy Relating to Students with LD

Few studies have examined the relationship between general education teachers’
efficacy beliefs and outcomes related to instructing students with LD. Teachers’
beliefs about students with LD are important to the success of these students
(DeSimone & Parmar, 2006). Just as the previous section discussed teacher efficacy
declining with teaching experience (after graduation), Soodak, Podell and Lehman
found that teacher efficacy, and receptivity towards meeting the needs of students
with LD, also declined with teaching experience (1998). Their finding supported
Wilczenski’s earlier finding regarding the declines as preservice teachers enter the
field (1993). Several reasons have been explained for this. Firstly, it is possible that as
efforts to help students with LD do not result in the desired effects, this can result in a
decline of teacher efficacy towards students with LD. Secondly, it could be argued
that more recently trained teachers have learnt effective strategies for teaching
students with LD (Soodak et al., 1998).
Bender and Ikechukwu (1989) found that teachers who had completed professional development and courses within special education indicated having higher teacher efficacy and used more effective instructional strategies with students with special educational needs than those who had not completed any recent professional development or courses within special education. Brownell and Pajares (1996) claimed that the differences in teachers’ efficacy and perceived quality of their special education coursework within their training is due to teacher preparation programs in tertiary institutions not being created equally. Thus, Brownell and Pajares (1996) concluded that tertiary institutions need to redesign their programs in instruction and curriculum to include more quality coursework and experiences in special education. This is particularly important as research has shown that teachers who hold more efficacious beliefs are more likely to engage in more effective educational practices than their less efficacious peers (Brownell & Pajares, 1996).

In regards to general education teachers working with students with special needs, Ross and Bruce (2007) state that, teachers who have high teacher efficacy for teaching students with LD and behavioural difficulties are more likely to engage in effective instructional practices, than their colleagues with low teacher efficacy.

Jordan and Stanovich (2003) found that teacher efficacy towards students with disabilities was positively related to teaching skills and practices. Their research addressed the nature of teachers’ beliefs about their roles and responsibilities with students with disabilities, and how these influence their intentions to act. Teacher efficacy beliefs may contribute differently to teachers’ instructional practices. This in turn could influence student achievement outcomes. According to Jordan and Stanovich (2003), requiring teachers to change their practices will depend in part on influencing teachers’ beliefs about the nature of LD.
2.8.3 Efficacy, Beliefs and Classroom Strategies

A positive association has been found between teacher efficacy beliefs and student self efficacy (Anderson et al., 1988). Teacher efficacy has also been linked to teachers’ classroom behaviour and practices (Romi & Leyser, 2006); student motivation (Goddard, Hoy & Woolfolk-Hoy, 2000); and student achievement and expectations (Goddard et al., 2000; Lantner, 2003). Teachers with high teacher efficacy are more likely to experiment with teaching techniques and instructional materials while seeking improved instructional techniques (Allinder, 1994; Davies, 2004; Romi & Leyser, 2006). Furthermore, the relationship between teachers’ efficacy and student performance is viewed as bi-directional (Rimm-Kaufman & Sawyer, 2004). According to Ross (1998), teachers have a higher teacher efficacy when their students do well. Likewise, students do well when teachers have a high teacher efficacy. Evidence suggests, then, that teacher efficacy and beliefs drive instructional pedagogy (Witcher, Onwuegbuzie, Collins, Witcher, Minor, James & Terry, 2002).

Overall, research has found correlations between teacher efficacy and classroom strategies. For example, Fuchs, Fuchs and Phillips (1994) argued that highly efficacious teachers are likely to respond to students who fail as a challenge and provide students with more support and reinstruction. Highly efficacious teachers are also likely to try new instructional techniques (Davies, 2004; Gerges, 2001; Ross, 1998; Tschannen-Moran et al., 1998); devote more time to academic instruction and take greater responsibility for educating students with LD (Dembo & Gibson, 1985); are more organised (Tschannen-Moran et al., 1998); are less likely to criticise students for giving the incorrect response, and are more likely to persist with a student in a failure situation (Davies, 2004; Ross, 1998; Tschannen-Moran et al., 1998); perform more challenging tasks and set higher goals (Witcher et al., 2002); are more likely to emphasise higher order instructional emphasis for all students (Allinder, 1994; Davies, 2004; Ellis, 2002); are more progressive in their approach (Woolfolk et al., 1990); and, assume greater responsibility for making sure students learn (Woolfolk-Hoy, 2003). These differences can be due to highly efficacious teachers having a more
positive impact on student learning because of their teaching orientation than less efficacious teachers (Swars, 2005).

Moreover, less efficacious teachers tend to project the responsibility of student failure to outside their (teacher’s) control. They often attribute student failure to the home environment, genetically or from parental influence, or to the students themselves (Ashton & Webb, 1986). Conversely, Georgiou and colleagues (2002) found no significant relation between teacher efficacy and attribution factors. However, they did find, in accordance with Tschannen-Moran and colleagues (1998) that high levels of teacher efficacy did have an impact on teachers’ sense of control and on their effort to improve a student’s low performance and motivation. They also found that those with a higher sense of teacher efficacy were more accepting of students and were negatively correlated to anger (Georgiou et al., 2002).

These findings clearly suggest that a student who faces serious difficulties with his or her achievement, like students with LD, is more likely to receive better and more consistent treatment from a highly efficacious teacher who is willing to accept part of the responsibility for the student’s achievements (or lack of), and sees failing students as a challenge rather than a problem in class (Georgiou et al., 2002).

2.9 TEACHER RESPONSE

2.9.1 Teacher Response to Efficacy, Expectancy and Student Achievement

A number of important factors contribute to teachers’ expectations of students, which in turn impacts upon the strategies teachers use in the classroom, and thus, opportunities students have in the classroom to achieve. For example, expectations that teachers have of their own performance (teacher efficacy) contribute towards high or low expectations of students. A major component of teacher efficacy is the issue of classroom control (Bamburg, 1994; Miller, 2001; Woolfolk-Hoy & Spero, 2005).
Many classroom teachers engage in classroom management practices to gain control over students and their learning, even when they know that this will tend to decrease students’ opportunities to learn (Bamburg, 1994). Moreover, teachers are likely to use more teacher-controlled practices in the classroom for students of low ability compared to students of high ability. This is often due to the belief that students of high ability, and with high expectations from the teacher, are seen as less of a threat in misbehaviour than those with low ability and low expectations (Bamburg, 1994).

Furthermore, expectations are shaped partly from teacher and student perceptions of the reasons for the student’s successes and failures (attribution). This in turn can affect the expectations that teachers have of their own performance (teacher efficacy), and the way that teachers respond to students in the classroom (Miller, 2001). Miller (2001) states that teachers who produce the greatest learning gains for students, often accept the responsibility for the students’ learning (higher teacher efficacy) and have higher expectations of students. To sum up, teachers who attribute a child’s success to internal factors, and failure to external factors, are more likely to have higher expectations of the student, and thus accept more responsibility for their learning (teacher efficacy). This will possibly impact upon their classroom strategies.

2.9.2 Teacher Response to LD

Westwood (2006) recently reflected upon his earlier study in 1995 to see whether teachers’ conceptions and understandings toward students with LD had changed. His conclusion clearly stated that teachers still view students with LD from a medical (deficit) model rather than an educational model (Westwood, 2006). He found that teachers still believe that the causes and problems of LD are within the student (blaming the victim) rather than external factors such as curriculum and pedagogy (Westwood, 2006). This supports the findings from Jordan, Kircaali-Iftar, and Diamond (1993) in that teachers generally attribute the cause of the problem, for students with LD, to internal factors (within the student), such as low ability, or to the student’s background, such as parental support (Jordan et al., 1993).
These reactions could be the result of underlying confusion that teachers, educators and society have about students with LD. Westwood (2006) concluded that there were well-defined deficiencies in teachers’ conceptions (or misconceptions in their case) of students with LD. Their results strongly indicated that the teachers were ignorant of what constituted a LD. Furthermore, Margalit and Almougy (1991) found that students who were labelled as LD were regarded by their teachers as “less intelligent, more dependent on others, and less creative” (p. 411) than students without the LD label. Moreover, Turkington and Harris (2003) claimed that teachers often need to be told that students with LD are not the same as students with intellectual impairments, sensory impairments, autism, or behavioural disorders. In addition, Culatta and Tompkins (1999) stated that teachers do not understand the difference between students with LD and slow learners. A study by Brook, Watemberg, and Geva (2000) revealed that there is a prevalence of teacher misconception that a LD is a consequence of parental spoiling and that LD students are just lazy. Brook and colleagues’ (2000) study found that 60% of teachers believed that LD disappears with age.

These misperceptions of students with LD often lead to low expectations and different teacher responses compared to students without LD (Westwood, 2006). For example, in Siperstein and Goding’s study (1985), teachers expected students with LD to exhibit a wide range of negative behaviours and attempted to prevent the behaviours through negative non-supportive behaviour, even though students did not actually display any behaviour that was different from the others in the class.

Many studies have proposed that if teachers held higher expectations of students with LD, then there would, more than likely, be noticeable improvements in the students’ achievements (Culatta & Tompkins, 1999; Turkington & Harris, 2003; Westwood, 2006). These support the original findings from Rosenthal and Jacobson (1968). Studies by Chan (1991), Deshler (2005), Ellis (2005a), Lerner and Kline (2006) and Westwood (2006) have looked at interventions to support students with LD, having a perspective on the causes of LD as inefficient approaches to learning, rather than factors within the learner. Some of these include focusing on explicit training in metacognitive strategies, task-approach, and, self-instruction and self-monitoring.
techniques. These can help students with LD to achieve at a higher level than expected, which in turn increases self-esteem and confidence.

In summary, teachers who attribute a child with LD’s problems to innate characteristics of the student, coupled with outside influences such as home and culture, will be more reluctant to review teaching methods or to revise the curriculum content, which will form the perception that students with LD are beyond repair (having a low teacher efficacy). Moreover, this will tend to create lower expectations from the teachers and teaching strategies that give students substantially limited opportunities to succeed and achieve (Bamburg, 1994; Miller, 2001; Westwood, 2006).

### 2.10 MISDIAGNOSING STUDENTS’ POTENTIAL TO LEARN

When teachers have low expectations of students, and relate causes of difficulties or failures to within students, as is often the case for students with LD (Gottlieb, Gottlieb, Schmelkin & Curci, 1983; Margalit & Almougy, 1991; Westwood, 2006), they are attributing the causes to internal, stable, and uncontrollable factors. This in turn implies that it is an emphasis on ability, or lack thereof, which in turn creates a low expectation of students’ future achievements, as it is unlikely to change over time (Stevenson & Stigler, 1992).

Stevenson and Stigler (1992) carried out a study, which is reported in their book ‘The Learning Gap’. They compared Japanese and Chinese educational practices and beliefs with those found in the United States. They found that although the Asian countries acknowledged differences in individuals’ innate abilities, they considered hard work to be of greater importance than ability for students’ academic achievement. Conversely, in the United States they emphasised innate abilities to a greater extent and effort far less often than in Japan and China. Stevenson and Stigler claimed that in the United States those students who perform poorly in the classroom are perceived by teachers (and eventually believe this themselves) to have a low ability. In turn Stevenson and Stigler claimed that this results in teachers and students
believing that, regardless of how hard they try, they will not be able to master their schoolwork. Alternatively, within the Asian cultures, they do not regard poor performances as a sign of low ability, but rather that the student has not yet achieved their potential through persistence and hard work. In other words, Japan and China give primary attention to the influence of effort on all forms of accomplishment, creating the belief that all students are able to achieve satisfactorily in school if they are willing to study hard (Stevenson & Low, 2002). In contrast, it could be suggested from this that the United States gives greater attention to the influence of innate ability, creating the belief that students with the ability are more likely to achieve, whereas students without the ability are more likely to fail (Stevenson & Stigler, 1992).

From the above discussions, it could be postulated that students with LD (who are identified when there is a disparity between their intelligence and achievement in the classroom) are seen as poor performers in the classroom due to internal, stable and uncontrollable factors (ability). According to Stevenson and Stigler (1992), and Stevenson and Low (2002), in the United States more teachers have the belief that no matter how hard they (as teachers) try to teach these students, they are beyond successful academic progress (unalterable learners). Thus, in turn, it can be predicted that teachers will have a low teacher efficacy, which keeps their expectations low, and they will create learning environments which produce future poor performances and failures. Alternatively in Japan and China, it could be postulated that students with LD are seen as poor performers in the classroom due to internal, unstable and controllable factors (effort). According to Stevenson and Stigler’s findings, then, more teachers would, in this case, have the belief that no matter what the student’s ability, teachers can teach these students to make successful academic progress (Stevenson & Low, 2002; Stevenson & Stigler, 1992). By having the focus on effort that is within the control of the student, teachers are likely to believe that they (the teachers) could make far greater differences in teaching the student with LD and improve their learning (alterable learners). This, in turn, could predict that teachers will have a high teacher efficacy, which will keep their expectations high, and they will create learning environments which produce greater opportunities for students to learn and succeed.
2.11 SUMMARY

Prolonged failure, it is argued, will have a greater detrimental influence on students’ self-worth as continuous negative learning outcomes give rise to low achievement expectations and feelings of helplessness (Chapman, 1988; Licht & Kistner, 1986). Students with LD are often depicted as lacking confidence in their ability and having low expectations of future academic achievements, which are often strongly influenced by teachers in their responses and behaviours towards these students. Clearly, it is not acceptable for teachers to consciously or unconsciously engage in behaviour and create learning environments that cause students to be academically unsuccessful. Nor can it be acceptable for teachers to give attributional messages, and hidden expectations towards students that they are simply not able to achieve and therefore not expected to improve in the future (Bamburg, 1994; Miller, 2001; Westwood, 1995, 2006).

However, it is essential that teachers be helped to fully understand students with LD and that many attributes and aptitudes of students can be modified and enhanced by skilled teaching (Westwood, 2006). As Hilliard (1991) states “just as there is a vast untapped potential, yes, genius, among the children, there is also a vast untapped potential among the teachers who serve children” (p. 36). Hilliard believes that the professional potential of teachers has been drastically underestimated, just as students often are.

Moreover, Tollefson, Melvin, and Thippavajjala, stated that “before teachers can begin to look at themselves and at the possible effects of their attributions on their students’ achievement, administrators and school psychologists will need to understand the risk of the self-esteem of teachers that accompanies teachers accepting greater responsibility for students’ achievement” (1990, p. 82).

Teachers must avoid lowering their academic demands and expectations out of a desire to help students attain and maintain self-esteem. Elbaum and Vaughn (2001) stated that having lowered expectations of academic success can, in the long run,
actually subvert the goals of enhancing students’ self-esteem. Perhaps the reforms in education should start with the principle that:

to help students succeed, we must expect that they will succeed and then create educational environments in which teachers work together to remove the barriers and to ensure that all students are given opportunities and skills that support their attainment of long-term success and growth. (Elbaum & Vaughn, 2001, p. 36)

However, little can be gained by insisting that teachers change the classroom environment until educators, and tertiary institutions also commit themselves to change what schools do and how they do it (Bamburg, 1994).

**2.11.1 Gaps in the Research**

In summary, this review of the research and literature shows that even though most educators are familiar with the term LD, and have come across students with LD in their classroom, there are still major unresolved issues surrounding LD. These include using and defining the term LD (especially within Australia); identifying students with LD; and, attitudes and misunderstanding of students with LD’s abilities and expectations. Given that students who are identified as LD are often viewed differently and treated differently by teachers (Cook, 2001), attribution theory may provide salient information about the processes and effects of these perceptual differences. Moreover, given the significance of teacher attributional feedback in regards to future student motivation, the study of how preservice teachers perceive students with LD is thus important. However, even though a great amount of research has been done in regards to attribution theory within the classroom, very little has been done regarding teachers’ attributions of students with LD. The only research that has been done in this area has focused on practising teachers in the US, Guatemala and UK. No research to date has applied attribution theory to students with LD in relation to the training of preservice teachers. Nor has research to date done this within an Australian context.
In regards to attitudes towards students with LD, some research has been undertaken in relation to teachers’ attitudes towards students with LD in comparison to other types of students within the US, and Europe. However, once again minimal attention has been focused on preservice teacher attitudes towards students with LD. Similarly, in Australia, some studies have focused on teachers’ attitudes towards students with disabilities in general, but little has explored their attitudes towards students with LD specifically. Perhaps this has to do with the ongoing difficulties of defining the condition in Australia.

Teacher efficacy has developed over recent years within the theoretical framework of social cognitive theory. Research has shown that there is a link between how efficacious teachers are and their instructional strategies (behaviour) carried out in the classroom that impacts upon students’ learning and achievement. Research has also been carried out on practising and preservice teachers. However, even though an attempt has been made to link teacher efficacy and attribution theory, no research to date has linked teacher efficacy to attribution theory within the field of students with LD, nor in relation to preservice teachers.

Given the gaps in the research previously undertaken as discussed in this literature review, the present study aimed to redress this by including the following foci:

- To identify the causal dimensions of LD as perceived by preservice teachers. The study sought to examine comparisons between LD and NLD students.
- To examine how, and in what ways, preservice teachers would use different instructional strategies at different frequencies for students with LD in comparison to students without LD.
- To investigate the extent to which compulsory inclusive education subjects (carried out at universities) significantly influence preservice teachers’ attitudes, teacher efficacy, and perceived use of instructional strategies for students with LD.
- To explore whether a positive correlation between preservice teachers’ attitudes towards students with LD, attitudes towards differentiation, and their teacher efficacious levels exists.
To find out whether a relationship exists between preservice teachers’ attitudes and teacher efficacious levels, and the influence they have on attributional responses and instructional strategies perceived to be used for students with LD.

The purpose of this study will be elaborated upon in greater detail, along with hypotheses that were created from the literature and research, in the subsequent chapter.
CHAPTER 3 – METHODOLOGY

3.1 INTRODUCTION

The previous chapter reviewed the literature on teachers’ understanding and attributional causations towards students with LD. It also discussed teacher efficacy, and attitudes towards students with LD. Finally, the previous chapter examined the literature about how attitude and teacher efficacy can impact upon the attributional responses, and behaviour and instructional strategies that teachers use in the classroom with students with LD.

The beliefs that preservice teachers have about their ability to make a difference to students’ learning, and their attitudes towards students with LD can impact upon the classroom instructional strategies that they use. This in turn affects the opportunities that these students may have in the classroom. Thus, it is critical to understand these perceptions and to what extent tertiary institutions are preparing preservice teachers for teaching students with LD.

The intention of this chapter is to provide a detailed description of the purpose of the research study, the population and sample used in the study, the instrument used to collect the research data, techniques used for conducting this particular research study, and the analytical processes used.

The first section discusses the purpose of the research study, which is based on the research and literature discussed in the previous chapter. It also discusses the stated hypotheses that have guided the methods and analytical processes used. The second section describes the choice of research design in conjunction with the theoretical underpinnings of the study, examining the strengths and weaknesses of the design. The third section presents the context of the study describing the sites and participants used in the study. The fourth section discusses the underpinnings of the research instrument used for collecting data, created from previous research. The processes of
data collection and data analysis are covered in the fifth and sixth sections respectively.

### 3.2 PURPOSE OF THE RESEARCH STUDY

The purpose of the present study was multifaceted. Firstly, it was to test basic attributional principles as applied to students with LD. The investigator sought to explore to what degree preservice teachers’ knowledge of the presence or absence of a LD would influence (a) the feedback given to a hypothetical boy based on his ability and the effort expended, (b) the frustration and sympathy preservice teachers felt towards each boy, and (c) the expectations that preservice teachers held for each student’s future.

Secondly, the study compared the instructional strategies that preservice teachers would use with students with LD when compared with strategies used with NLD students. The investigator sought to explore which instructional strategies preservice teachers would advocate using for students with and without LD, and how often they favoured the use of the strategies.

Thirdly, the study investigated to what extent compulsory inclusive education subjects have a significant influence on preservice teachers’ attitudes, teacher efficacy, and perceived use of instructional strategies for students with LD. The study compared the responses of students who had not completed a compulsory inclusive education subject to those who had, to see whether the compulsory subject had a significant influence.

Fourthly, the study examined the relationship between preservice teacher efficacy and attitudes towards students with LD. The investigator sought to explore (a) the attitudes that preservice teachers have towards students with LD, and towards differentiation of the curriculum, and, (b) whether there is a correlation between these attitudes, and the teacher efficacious level preservice teachers possess.
Finally, the study examined whether a relationship exists between preservice teachers’ attitudes and efficacious levels, and the impact that these have on attributional responses and instructional strategies intended to be used in the classroom.

Students with LD are unique with regard to ability level, self-control level, area of severity, and other relevant factors. Thus, the research study was conducted to ascertain whether preservice teacher attributions, teacher efficacy, attitudes, and instructional strategies they might use, share this uniqueness or are stereotypical in regards to labelling students with LD. Thus it is expected that this study will have implications for the ways in which teachers are trained to respond to and meet the needs of students with LD.

### 3.2.1 Research Study Hypotheses

Given the previously discussed research and literature on students with LD and educators’ attitudes, attributions, and efficacy, the following hypotheses were formulated.

**H1.** Preservice teachers within Australia respond differently to students with and without LD. Preservice teachers:

- will be more positive and less negative towards students with LD than students without LD;
- will feel less frustration towards students with LD than students without LD;
- will feel greater sympathy towards students with LD than students without LD; and,
- will hold greater expectation of future failure for students with LD than students without LD.

This is supported by Weiner’s (1993) proposal of ‘sin’ versus ‘sick’ in that LD is seen as a condition of ‘sick’ where the academic outcome is out of the control of the individual. Thus, students with LD fail due to low ability, a consequence of LD, and so deserve more praise, less frustration and more
sympathy by teachers. Due to LD being seen as a low ability, their expectations will also be low as ability is a stable cause.

**H2.** Preservice teachers would use different instructional strategies at different frequencies for students with LD in comparison to students without LD.

**H3.** Compulsory inclusive education subjects at tertiary institutions significantly influence preservice teachers’ attitudes towards students with LD and differentiation of the curriculum, teacher efficacy, and perceived use of instructional strategies for students with LD.

**H4.** There is a positive correlation among preservice teachers’ attitudes towards students with LD, their attitudes towards differentiating the curriculum, and their teacher efficacious levels.

**H5.** Preservice teachers’ attitudes and teacher efficacious levels are predictive of their preferred instructional strategies for students with LD.

**H6.** The responses that preservice teachers give students with LD (feedback, frustration, sympathy, and expectation of future failure) differ due to their attitudes and teacher efficacious levels towards students with LD.

### 3.3 POPULATION AND SAMPLE

This study was carried out across New South Wales in four areas (Sydney, Wollongong, Wagga Wagga and Bathurst). This was to consider possible variation across the different areas from urbanised (Sydney) to suburbanised (Wollongong) and rural (Bathurst and Wagga Wagga). The population in Sydney is currently 4,119,190 (21% of the Australian population). Of this population, 31.7% were born overseas, and 64% speak English at home. The median age of the population in Sydney currently lies at 35 years of age (Australian Bureau of Statistics, 2007).
The population of Wollongong is currently 263,535 (1.3% of the Australian population). Of this population, 20.1% were born overseas, and 81.6% speak English at home. The median age of the population in Wollongong currently lies at 37 years of age (Australian Bureau of Statistics, 2007).

The population of Wagga Wagga is currently 52,489 (0.26% of the Australian population). Of this population, 6.7% were born overseas, and 93.7% speak English at home. The median age of the population in Wagga Wagga currently lies at 33 years of age (Australian Bureau of Statistics, 2007).

The population of Bathurst is currently 30,744 (0.15% of the Australian population). Of this population, 7.5% were born overseas, and 91.6% speak English at home. The median age of the population in Bathurst currently lies at 33 years of age (Australian Bureau of Statistics, 2007).

As can be seen, each area is different and covers a vast range of the population throughout the State of New South Wales.

### 3.3.1 Population

Within the rural areas, the study consisted of preservice teachers enrolled in teacher training degrees at Charles Sturt University’s (CSU) Wagga Wagga and Bathurst campuses. Urbanised and suburbanised areas consisted of preservice teachers studying at Macquarie University (MQU) and the University of Wollongong (UOW) respectively. Although 71.3% of CSU’s students are enrolled and study via distance education, CSU Wagga Wagga campus has 3,371 (38.9% of CSU total internal population) students enrolled on campus (CSU statistical profile, 2005). Of these it is estimated that 1348 are from regional rural New South Wales (NSW), 1732 are from other areas around Australia, while 291 are from overseas (CSU Statistical profile, 2005). Of the 3,371 students enrolled on campus 650 (19%) are enrolled in preservice teacher courses. The average age of students at CSU Wagga Wagga campus is 22.9 (females) and 23.5 (males) years of age (Spennemann, 2004).
CSU Bathurst campus comprises 3,104 (35.8% of CSU total internal population) students enrolled on campus (CSU statistical profile, 2005). Of these it is estimated that 1241 are from regional rural NSW, 1595 are from other areas around Australia, while 268 are from overseas (CSU statistical profile, 2005). Of the 3,104 students enrolled on campus 750 (24%) are enrolled in preservice teacher courses. The average age of students at CSU Bathurst campus is 22 (females) and 23.3 (males) years of age (Spennemann, 2004).

The University of Wollongong campus comprises 21,000 students enrolled on campus (UOW Annual Report, 2005). Of these, 7770 (37%) are from the Illawarra region, 5250 (25%) are from the Sydney region, 1260 (6%) are from other parts of NSW, 420 (2%) are from other states around Australia, and 6300 (30%) are from overseas (UOW Annual Report, 2005). Of the 21,000 students enrolled on campus 2,100 (10%) are enrolled in preservice teacher courses. The average student age at UOW is 21-25 years of age (UOW Annual Report, 2005).

Macquarie University comprises 31,660 students enrolled on campus (Macquarie University Annual Report, 2006). Of these, 15,197 (48%) are from Sydney, 4749 (15%) are from other parts of NSW, 950 (3%) are from other states around Australia, and 10,764 (34%) are from overseas (Macquarie University Annual Report, 2006). Of the 31,660 students enrolled on campus 1750 (5.5%) are enrolled in preservice teacher courses. Sixty percent of students at MQU are under the age of 25 years (Macquarie University Annual Report, 2006).

The population of this study consisted of 667 preservice teachers studying at Charles Sturt University, Wagga Wagga Campus (n = 128), Bathurst Campus (n = 210), University of Wollongong (n = 247) and Macquarie University (n = 82). Of these, the only main difference to consider was the age of participants. Whereas CSU Wagga Wagga campus (23.4), Bathurst campus (23.9) and UOW campus (24.6) were of similar ages, participants at MQU campus averaged at (29.3), a somewhat older age.
3.3.2 Sample

Respondents of this study, as mentioned before, were selected from three universities over four campuses across New South Wales. Respondents were selected according to the course and year in which they were enrolled. Respondents were either enrolled in a primary education teaching degree (n=494) or secondary education teaching degree (n=154) (19 gave no information about this), including undergraduate (n=484) and postgraduate (n=166) (17 gave no information about this) courses. All three universities had one compulsory inclusive education subject across all of the selected courses. In the undergraduate courses at all three universities, the compulsory inclusive education subject was covered during the fourth semester of the course (second semester in the students’ second year).

Due to the fact that the compulsory inclusive education subject may impact upon how preservice teachers respond to the survey, the study sought to include students prior to (n = 270) and subsequent to (n = 214) completing the compulsory inclusive education subject. Thus, those preservice teachers studying at an undergraduate level in Semester three and Semester five were used for this study. Due to the fact that the current postgraduate programs were only two semesters in length, and that the compulsory inclusive education subject is covered in the second semester at the three Universities, none of the respondents completing a postgraduate course had completed the compulsory inclusive education subject (as the questionnaire was administered in their first semester). Thus, a total of 667 preservice teachers were used for this study.

3.4 RESEARCH DESIGN

The most appropriate way to examine the previously stated hypotheses, was to use a self-reported survey questionnaire. Most psychological measurements of attitudes and beliefs have employed self-reported survey questionnaires (Cunningham, Preacher & Banaji, 2001). Moreover, survey questionnaires are one of the most efficient research methods for collecting information from participants to describe, compare and explain their knowledge, attitudes, beliefs, and behaviours (Fink, 2003; Gay, Mills & Airasion, 2006; Mertens, 1998, 2005; Neuman, 2003; Punch, 2003). They are
particularly useful when measuring multi-theoretical components, and testing multiple hypotheses (Mertens, 1998, 2005; Neuman, 2003). Using survey questionnaires, data can be collected from a relatively large number of respondents across a large spectrum of areas (Best & Kahn, 2006).

Using a large number of respondents across a variety of different areas, can be said to bring about greater reliability in the data collected (Fink, 2003; Gay et al., 2006; Mertens, 1998, 2005; Neuman, 2003; Punch, 2003) and may often decrease researcher bias in the data collected (Fink, 2003; Punch, 2003). Using models of established instruments that have previously been used is often, through former testing and modification, thought to be more valid and reliable. Nevertheless even though previous studies have tested the reliability of the instrument, it is generally recommended that reliability is tested for the current study (Hoy & Woolfolk, 1993; Tschannen-Moran & Woolfolk-Hoy, 2001) (as will be discussed in the following sections regarding the instrument).

Most of the previous research carried out on attribution theory, teacher efficacy, and attitudes has utilised the use of survey questionnaires. The survey questionnaire instrument used for this study has been created from highly acceptable instruments used in earlier research studies. The survey instrument is mainly contextually presented in the form of vignettes and statements, in which, the responses to the contextualised information are in Likert scale form.

### 3.5 DATA COLLECTION INSTRUMENTS

The instrument used to collect the data for this study derived from theory and from previous empirical research instruments. The instrument consisted of five sections for respondents to complete (see Appendix 1). Section One contained demographic questions for respondents. This section was included so that comparisons and considerations across various demographic groups could be measured. Section Two consisted of the attributional vignettes questionnaire which elicited attributional responses toward students with and without LD. Section Three contained the attitude questionnaire which was concerned with attitudes towards students with LD, and
differentiation of the curriculum. Section Four included the teacher efficacy scale questionnaire which incorporated statements addressing beliefs about personal and general teacher efficacy. Finally, Section Five comprised a variety of instructional strategies preservice teachers would use for students with and without LD.

3.5.1 Section One: Demographic Questions

The first section of the survey questionnaire requested information about the respondents’ demographic details. This included standard information about respondents’ gender, age, nationality, university year, prior experience of students with LD, training to teach primary or secondary school students, and completion of the compulsory inclusive education subject (see Appendix 1).

The demographic questions were included for several reasons. Firstly, they were included to allow consideration of the varied backgrounds that respondents came from. Secondly, some of the factors (gender, experience with students with LD, and completion of the inclusive education subject) were necessary for the formal analysis of the data, including comparisons between groups of respondents.

3.5.2 Section Two: Attributional Vignettes Questionnaire

The attributional vignettes questionnaire was adapted from Clark (1997) who examined the way in which American teachers perceived the achievement of students with LD in comparison to students without LD. Vignettes may consist of text, images and other forms of stimuli to which research participants are asked to respond with their opinions and reactions to the content (Hughes & Huby, 2002; Schoenberg & Ravdal, 2000). When vignettes are used to answer quantitatively-focused research questions, according to Gould (1996), and Sumrall and West (1998), they can quickly generate considerable amounts of data. Even though vignettes cannot completely capture the reality of people’s lives, they can simulate real life experiences more than many other methods (Hughes & Huby, 2002; Schoenberg & Ravdal, 2000). Vignettes are also an appropriate tool to use with large samples.
Scholars from a variety of disciplines have used vignettes to study a range of topics which include: cognition and motivation (Stolte, 1994), behaviours (Burgio, Cotter, Stevens, Hardin, Sinnott & Hohman, 1995; Gavrilidou, Mesquita & Mason, 1993; Gutkin & Ajchenbaum, 1984; Poulou & Norwich, 2001), attitudes and perceptions (Arbeau & Coplan, 2007; Aubry, Tefft & Currie, 1995; Avissa, Reiter & Leyser, 2003; Brophy & McCaslin, 1992; Coleman & Gilliam, 1983; Farley, Bianchi & Colosanto, 1980; Ingamells & Goodwin, 1996; McNally, Cole & Waugh, 2001; Yoon, 2004), and attributions (Clark, 1997; Clark & Artiles, 2000; Prawat, Byers & Anderson, 1983; Woolfson et al., 2007).

Particularly in the US, researchers who have conducted in-depth investigations of teachers’ causal attributions, perceptions of self-efficacy, emotional reactions, or intervention choices predominantly employed the use of vignettes (Poulou & Norwich, 2001).

Although vignettes have certain common features (such as a brief and familiar hypothetical scenario, followed by statements and questions on decision-making) they can be modified to be consistent with the researcher’s topic and population of interest (Kayser-Jones & Koenig, 1994). When used as part of a survey instrument, they can also be seen as a relaxing, pleasant, non-threatening, and interesting approach which is likely to reduce the feeling of being overburdened by other methods such as interviewing (Kayser-Jones & Koenig, 1994).

Eight vignettes were created by Clark (1997) and adapted slightly for this study to fit within an Australian context. Each vignette described a hypothetical boy who had just taken a typical classroom test and failed. The vignettes did not specifically identify the cause of the hypothetical boys’ failures. The reason for this was to stimulate causal explanations on the part of the participants. Three types of information were provided in the description of each vignette: a statement of student ability, the typical pattern of effort expended by the student in the classroom, and information on academic performance. The statements identified half of the boys as LD and half as NLD, half as high ability and half as low ability, and, half as expending high effort and half as expending low effort. The boys were matched on ability (high or low), on
typical effort (high or low), and on the presence/absence of a LD (LD or NLD). Thus, eight vignettes, creating a two (ability) by two (effort) by two (LD/NLD) matrix were formed.

Table 3.5.1. *A Matrix of Two by Two by Two Vignettes*

<table>
<thead>
<tr>
<th>Ability</th>
<th>Effort</th>
<th>NLD</th>
<th>LD</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>High</td>
<td>Thomas</td>
<td>Steven</td>
</tr>
<tr>
<td>Low</td>
<td>Low</td>
<td>Phillip</td>
<td>James</td>
</tr>
<tr>
<td>High</td>
<td>Low</td>
<td>Christopher</td>
<td>Andrew</td>
</tr>
<tr>
<td>Low</td>
<td>High</td>
<td>Jeffrey</td>
<td>Brian</td>
</tr>
</tbody>
</table>

*Note.* For all vignette descriptions and details see Appendix 2.

The vignettes did not specifically use the terms high or low ability, high or low effort, or LD or NLD. The vignettes used language and explanations of the hypothetical boys that teachers would expect and be familiar with within classroom contexts. An example of a vignette (high ability / low effort / NLD) reads as:

Phillip is a student in your class. He has greater aptitude for academic tasks than most children in the class. Although he occasionally does excellent work, he is usually off task and does not participate in class often. He rarely completes class assignments and does not do much of his homework.

After respondents read the vignettes, they were presented with four questions which asked them about (a) feedback that they would give to the child, (b) the frustration that they would feel towards the child, (c) the sympathy that they would feel towards the child, and, (d) their expectation of the likelihood of the boy’s future failure.
3.5.2.1 Scoring

Each of the four questions that followed the vignettes was presented as a Likert scale item. The scale items used for the vignettes in Clark’s (1997) study were originally developed by Weiner and Kukla (1970). The first question, which asked respondents to rate their feedback towards the hypothetical boy, used a scale running from very positive to very negative feedback. Clark (1997) modified slightly the positive and negative feedback scale following the pilot test of the instrument, reducing the scale from a +7 to -7 scale to a +5 to -5 scale. The scale included ratings from +5 (very positive) through to -5 (very negative). Clark (1997) did not include a zero in the scale so as to force respondents to either give positive or negative feedback. This study also did not include a zero in the scale for similar reasons to Clark’s. However, as will be discussed further with reference to the analysis, this approach can result in difficulties when analysing participants’ responses. As a result of this re-coding was necessary and this will be discussed in due course. The second and third questions, which asked respondents to rate their frustration and sympathy towards each hypothetical boy, used a scale ranging from 1 (very little) to 7 (very much). The final question, which asked respondents to rate their expectation of the likelihood of the boy’s future failure, used a scale ranging from 1 (very unlikely) to 7 (very likely).

3.5.2.2 Development, Reliability and Validity of the Attributional Vignettes Questionnaire

The vignettes questionnaire was initially developed by Clark (1997). Prior to pilot testing the vignettes, Clark worked with a group of eight attribution graduate specialists, who were at the time conducting attribution research in general education and special education classroom contexts. They reviewed the vignettes to validate the level of ability and typical effort exhibited by each hypothetical boy, and to identify which of the boys had LD. All of the attribution graduate specialists approved of the final version of the vignettes.

In this study only three minor changes were made to Clark’s original vignettes. Whereas Clark’s second question referred to ‘anger’ teachers felt towards students,
this study used the term ‘frustration’ as it was more appropriate language here in Australia. The second change to the original vignettes was in regards to what Clark referred as the ‘resource specialist program’ which is not a term used in Australia. In this study this was referred to as services from the ‘support teacher learning’. Finally, the only other change was in the first question. Whereas Clark referred to reward and punishment, this study referred to it as positive feedback and negative feedback, as the term punishment was deemed to be too strong. All else was the same as the original vignettes.

The investigator piloted the modified instrument prior to collecting the data (as will be discussed) with a group of preservice teachers. In relation to the section on the vignettes questionnaire, the respondents, after completing the questionnaire, were asked to identify the types of boys that were addressed by the vignettes. Although at the beginning of the instrument it gave a definition of LD, oral and written comments indicated that respondents perceived the four boys who had LD as having LD (even though the term LD was not directly presented in the vignettes).

3.5.2.3 Recent Research with the Vignettes Questionnaire

Since the creation of the vignettes by Clark (1997), researchers have used or adapted Clark’s vignettes in a variety of studies. For example, Gray (2000) used an exact replica of Clark’s vignettes and followed on from Clark’s study in the US, focusing on secondary school teachers (and comparing his findings to Clark’s primary school teachers). Clark and Artiles (2000) replicated Clark’s previous study and examined a cross-national study of teachers’ attributional responses to outcomes of students with and without LD from elementary schools in California (US) and Guatemala City (Guatemala). Wood (2001) used a replica of Clark’s vignettes and created similar vignettes including not only boys with LD, but also those with Attention Deficit, Hyperactivity Disorder (ADHD), and Behaviour Disorders (BD). Woolfson, Grant and Campbell (2007) examined three groups (general education, mainstream learning support, and special education teachers) of teachers’ attributions for learner difficulties in their schoolwork. In order to explore their attributions of controllability and stability, they were asked to rate vignettes about students’ difficulties. Woolfson
and colleagues used Clark’s eight vignettes and modified them slightly for participants in the United Kingdom.

### 3.5.3 Section Three: Attitude Questionnaire

The attitude questionnaire was developed by the National Research Centre for the Gifted and Talented (NRCGT) staff at the University of Virginia as part of the Survey of Practices (SOP) instrument. The attitude questionnaire was created to assess the attitudes and beliefs about academically diverse learners and differentiated instruction appropriate for meeting their needs. It assessed attitudes towards gifted learners, LD learners and issues related to the differentiation of classroom strategies to meet the needs of academically diverse learners.

The attitude questionnaire in the initial study by the NRCGT (Tomlinson, Callahan, Moon, Tomchin, Landrum, Imbeau, Hunsaker & Eiss, 1995) included 35 items which addressed attitudes towards gifted learners, LD learners and differentiation in the classroom. The investigator of this study used a shortened version of the original instrument. The investigator used the relevant items that focused on respondents’ attitudes towards students with LD and differentiation in the classroom (as the statements referring to the gifted learners were irrelevant to this study). Thus, the investigator used 15 items from the original instrument, nine of which assessed attitudes towards differentiation in the classroom, and 6 of which were concerned with attitudes towards LD learners.

#### 3.5.3.1 Scoring

Respondents were asked to read each statement and then respond to each one on a Likert scale. The Likert scale included five points ranging from SA (strongly agree) through to SD (strongly disagree). Statements were either written positively or negatively. The statements that were written positively were recoded so that all statement scores were reflective of and comparative to one another (recoding will be discussed in section 3.7.1). Thus the higher the respondents’ score the more positive their attitude towards students with LD or differentiation in the classroom.
3.5.3.2 Development, Reliability and Validity of the Survey of Practices with Students of Varying Needs

The SOP was specifically designed for the initial study by NRCGT (Tomlinson et al., 1995). Items were designed to reflect the best practices for meeting the needs of academically diverse learners. A pilot study of the instrument was conducted in 1993. Based on the feedback from the participants and internal consistency estimates, the number of items in section one (attitudes) was reduced. Using Cronbach’s alpha, reliability for the 35 items was .76 and the SOP was found to have both content and face validity (Tomlinson et al., 1995). For this study 15 of the 35 attitude statements were used from the SOP section one. These consisted of statements referring to students with LD and differentiating the curriculum. After carrying out a factor analysis (which will be discussed in section 3.7.5), of the 15 statements, 11 created these two dimensions (i.e. attitudes towards LD and attitudes towards differentiation). Subsequent testing of reliability for the instrument resulted in the alpha coefficients being .70 (5 items) for attitude towards students with LD and .71 (6 items) for attitude towards differentiating the curriculum.

3.5.4 Section Four: Teacher Efficacy Scale Questionnaire

The Teacher Efficacy Scale (TES) questionnaire used in this study comes from Hoy and Woolfolk’s (1993) ten-item TES, which examined two specified dimensions of teacher efficacy (general and personal teacher efficacy). The ten-item TES included five statements relating to general teacher efficacy (GTE) (such as: ‘when it comes right down to it, a teacher really can’t do much because most of a student’s motivation and performance depends on his or her home environment.’), and five statements relating to personal teacher efficacy (PTE) (such as: ‘If I try really hard, I can get through to even the most difficult or unmotivated students’).
3.5.4.1 Scoring

Respondents were asked to read each statement and then respond to each one on a Likert scale. The Likert scale included six points ranging from 1 (strongly agree) through to 6 (strongly disagree). Statements were either written positively or negatively. The statements that were written positively were recoded so that all statement scores were reflective of and comparative to one another (recoding will be discussed in section 3.7.1). Thus the higher a respondent’s score, the more efficacious the respondent was.

3.5.4.2 Development, Reliability and Validity of the Teacher Efficacy Scale

Teacher efficacy scales were initiated by the two RAND Corporation studies (1976, 1977). In these studies, teachers’ efficacy was determined by computing a total score for their response to two five-point Likert scale items (see the two examples above). Since 1977 many teacher efficacy instruments have been created and used. The main ones have been Responsibility for Student Achievement Questionnaire (Guskey, 1982, 1987); the Teacher Locus of Control Scale (Rose & Medway, 1981); the 30-Item Teacher Efficacy Scale (Gibson & Dembo, 1984); the Webb Efficacy Scale (Ashton & Webb, 1986); and the Teacher Efficacy Scale Short Version (Hoy & Woolfolk, 1993). However, most of these options are now repudiated, and so most researchers have used the RAND items, the Gibson and Dembo Teacher Efficacy Scale, or a combination of the two (Coladarci & Breton, 1997). Hoy and Woolfolk’s Teacher Efficacy Scale is a shortened version of Gibson and Dembo’s scale, and it also includes the two RAND items.

Gibson and Dembo in 1984 developed a 30-item scale that yielded two factors consistent with the RAND items. These researchers used Bandura’s social cognitive theory of self-efficacy to interpret the two factors. Gibson and Dembo (1984) believed that one of their factors related to outcome expectations and the other related to teachers’ own self-efficacy regarding their teaching. Hoy and Woolfolk further supported the two separate independent factors using both the Gibson and Dembo
(1984) instrument and RAND items. Their initial findings reflected a general belief about teaching and also a personal belief about one’s personal sense of efficacy. They labelled these two factors general teacher efficacy and personal teacher efficacy respectively (Hoy & Woolfolk, 1993). Other researchers have also confirmed their existence (Anderson & Gerbing, 1988; Burley, Hall, Villeme & Brockmeier, 1991; Moore & Esselman, 1992; Soodak & Podell, 1993; Tschannen-Moran & Woolfolk-Hoy, 2001; Woolfolk-Hoy & Spero, 2005).

Hoy and Woolfolk’s short version of the Teacher Efficacy Scale (TES) only used ten items from Gibson and Dembo’s 30-item scale and RAND’s 2-item instruments. Reasons for this were that some of the original items loaded on both factors. Other researchers had shortened Gibson and Dembo’s 30-item scale to 16 (Soodak & Podell, 1993; Woolfolk & Hoy, 1990), however, other problems had arisen. For example, in Soodak and Podell’s (1993) study, they found that one GTE item loaded on the PTE factor and another item did not have a strong enough loading to be included on either factor. Due to these findings, Hoy and Woolfolk created the ten-item Teacher Efficacy Scale. The ten items (five for GTE and five for PTE) that Hoy and Woolfolk used were selected for their short version because they had the highest factor loadings for GTE and PTE in earlier research.

When Hoy and Woolfolk had initially created the TES short version, their reliability test for the instrument resulted in the alpha coefficients of reliability scoring .77 for PTE and .72 for GTE. Factor analysis with Varimax rotation for this study yielded the two factors with alpha coefficients of reliability scoring .67 (5 items) for PTE and .66 (5 items) for GTE, which suggests acceptable evidence of the reliability of these scales (Glass & Hopkins, 1996).

Hoy and Woolfolk’s TES short form has in recent years enjoyed the most acceptance and use (Woolfolk-Hoy & Spero, 2005). For example, Ross (1994) called the TES a ‘standard’ measure in the field. Moreover, Woolfolk-Hoy and Tschannen-Moran have very recently developed a new measure of efficacy called the Teachers’ Sense of Efficacy Scale’ (TSES). However, even though they believe that it will be superior to previous measures of teacher efficacy it has been stated that it still needs further
testing and validation prior to its formal usage (Tschannen-Moran & Woolfolk-Hoy, 2001; Woolfolk-Hoy & Spero, 2005).

### 3.5.4.3 Recent Research with the Teacher Efficacy Scale

The Teacher Efficacy Scale (TES) has been included in a variety of studies recently. In 2001, Henson used the TES as part of an instrument in a mixed methods study to examine participatory teacher research as an active, collaborative means of professional development for teachers, including its effect on teacher efficacy and empowerment. Henson used an exact replica of the original TES from Gibson and Dembo (1984) to measure general and personal teaching efficacy.

Later, Henson and Chambers (2002) used Hoy and Woolfolk’s (1993) revised shortened version of the TES as part of an instrument. They examined the personality types of 120 teachers pursuing teacher qualification through an emergency permit teacher education program, as predictors of classroom management and self-efficacy beliefs.

Milson and Mehlig’s (2002) study on primary school teachers’ sense of efficacy for character education developed the Character Education Efficacy Belief Instrument (CEEBI) which incorporated a revised version of Gibson and Dembo’s original TES. They used their instrument on 270 primary school educators to measure their sense of efficacy for character education. Their reliability test for the TES part of the instrument resulted in the alpha coefficients of reliability being .83 for PTE and .61 for GTE.

Burton, Bamberry and Harris-Boundy (2005) claimed that the concept of teaching efficacy had up until recently been exclusive to only schools and classroom teachers. In their study that focused on higher education, they examined the effectiveness of a teaching seminar designed to increase the teaching efficacy of new PhD students, which included them teaching within the faculty as part of their PhD program. They modified Hoy and Woolfolk’s (1993) shortened version of the TES to correspond to
their particular population. Their factor analysis created the two factor loadings of personal teacher efficacy and general teacher efficacy.

Rheams and Bain (2005) focused their study on early childhood teachers’ attitudes toward social interaction interventions appropriate for young children with disabilities. In this study 137 early childhood teachers completed their developed instrument (Social Interaction Program Features Questionnaire – SIPFQ). Their questionnaire included a replica of Gibson and Dembo’s (1984) original TES to provide a measure of teacher efficacy, and the resulting analysis created the two factor loadings of personal teacher efficacy and general teacher efficacy. Although their reliability score for the personal teacher efficacy component was acceptable, reliability score for the general teacher efficacy component was lower than recommended standards. Due to this they only used personal teacher efficacy scores in the data analysis.

Vannatta and Fordham in 2004 created a Teacher Attribute Survey (TAS) to assess 170 K-12 teachers’ teacher self-efficacy, teacher philosophy, openness to change, amount of professional development, amount of technology training, years of teaching, hours worked beyond the contractual work week, and amount of teacher and student use of technology in the classroom. Several reliable existing instruments in the development of TAS including the Woolfolk and Hoy (1990) original version of the TES, were used in the Vannatta and Fordham study.

Robbins (2005), in her PhD thesis focused on culturally responsive teaching across the career span. She examined the beliefs of preservice, experienced and expert teacher participants on different measures of culturally responsive teaching. Hoy and Woolfolk’s (1993) TES revised short form was also used to measure their efficacy beliefs. Finally, Lewandowski (2005), in her EdD thesis examined elementary teachers’ sense of efficacy in 17 rural elementary schools in US. Part of her data collection incorporated Hoy and Woolfolk’s (1993) revised short form TES. Clearly it can be seen that the TES has contributed strongly to research in this area.
3.5.5 Section Five: Instructional Strategies Questionnaire

The final section of the survey instrument was the Instructional Strategies Questionnaire (ISQ). The ISQ was derived from two previous instruments: the SOP developed by the NRCGT (Tomlinson et al., 1995); and, the Differentiated Practices Survey (DPS) developed by Hootstein (1998). The Instructional Strategies Questionnaire was created to elicit which instructional strategies preservice teachers would probably use both with and without LD students, and how frequently they were likely to use them.

This section used nine of the original fourteen instructional strategies included in the SOP instrument. Five were excluded due to being tailored more specifically towards gifted and talented students, and/or being deemed irrelevant within an Australian context. This section also included eleven of the original fifteen instructional strategies included in the DPS instrument. Four of these were also excluded due to being deemed irrelevant within an Australian context. Thus, the ISQ included twenty instructional strategies for respondents to answer.

3.5.5.1 Scoring

The ISQ included twenty Likert scale instructional strategies for both LD and average students, and respondents were asked to rate the frequency of each instructional strategy for each type of student. The Likert scale included five points ranging from 5 (very frequently) through to 1 (never). Thus the higher the respondents’ score the more frequently they would use the instructional strategies with average students and/or students with LD (see Appendix 1).

3.5.5.2 Development, Reliability and Validity of the Instructional Strategies Questionnaire

This study used twenty instructional strategies for students with LD and average students. After carrying out a factor analysis, of the twenty instructional strategies,
two factors (LD higher cognitive level instructional strategies and NLD higher cognitive level instructional strategies) were developed. A reliability test for the instrument resulted in the alpha coefficients of reliability being .77 (5 items) for NLD strategies and .71 (5 items) for LD strategies.

3.5.5.3 Recent Research with the SOP and DPS

The Survey of Practices of Differentiation in the classroom has been included in a few studies recently. In 2001 Megay-Nespoli used the SOP to examine the teaching beliefs of preservice teachers towards academically talented learners. The sample consisted of 64 preservice teachers who were training to become primary school teachers. Pierce and Adams (no date) examined preservice (N=85) and experienced teachers’ (N=95) attitudes and practices in relation to academically diverse learners. They used the first section (attitudes) of the SOP, for which the alpha coefficient was .87. McGurk (2006) studied the impact of study group participation on primary school preservice teachers’ attitudes, beliefs, and skills in implementing differentiated instruction over the course of their students’ teaching experience. McGurk used a replica of the SOP at the beginning and end of the students’ teaching experience. These studies indicate an on-going usefulness for both these tools.

3.6 DATA COLLECTION PROCEDURE

3.6.1 Approval

In order to gather data from the selected Universities and to administer the instrument, permission from several sources had to be obtained. The relevant organisations and persons were as follows:
3.6.1.1 Human Experimentation Ethics Committee (University of Wollongong)

According to the regulations of the University of Wollongong, each experiment or item of research in which human beings are involved as respondents of the study must be approved by the Human Experimentation Ethics Committee. This committee granted its permission.

3.6.1.2 Heads of the Faculties of Education at each University

In order to carry out this research at the designated University campuses, firstly, permission was necessary from the Head of Faculty of Education across all of the University campuses. Secondly, permission and organisation with each university lecturer who, at the time, was teaching the relevant cohort of preservice teachers required for the study was necessary. The investigator approached the Head of each Faculty of Education across the University campuses and explained the aims of the research and the procedures of data collection. In addition, a summary of the research proposal with a cover letter, and ethical approval from the investigator’s University (UOW), was sent via e-mail from the investigator. Permission was granted from all heads and lecturers at each University campus.

3.6.1.3 Participants’ Permission

Participants were given information from the university lecturers about the research project and the survey questionnaire. They were given the opportunity to leave the lecture room prior to the questionnaire being distributed and completed. Participants were informed that completing the survey represented their consent to having their data included in the study.
3.6.2 Pilot Study

Prior to administering the instrument on the sample, and even though each part of the instrument was used from previous studies that tested validity and reliability, it was necessary to administer the instrument to a pilot group. This was to ensure that respondents fully understood each question and response for each part of the instrument. The sample size for this pilot study was 40 preservice teachers who were in their third undergraduate year (and who would have been in their fourth and final year during the actual administration of the final version of the instrument. Thus, these respondents were not to be included in the final research sample).

During the pilot study, participants were asked to comment on the clarity of the vignettes, statements, and questions, any problems they encountered, and changes that they would make. They were also invited to include any thoughts or ideas that they believed were helpful. The instrument was revised in response to the participants’ comments. Based on the comments that were made, several minor changes were made to the instrument prior to administering the instrument to the entire sample. For example, as well as the changes to the vignettes discussed earlier, other changes were minor, such as the way in which some of the sections were formatted (i.e. having the Likert scale score headings clearer).

3.6.3 Administration of Instrument

After gaining permission at each University campus to administer the survey, the investigator had a teleconference with each academic whose students would be participating in the survey. In this session the investigator explained the aims and procedures of the survey, and gave a brief overview of the five sections of the survey instrument. Each academic who was involved in collection of the data was sent a sufficient number of surveys.

Academics were asked to follow a set procedure in collecting the data. Surveys were to be completed by students at the end of one of the academics’ lectures with students. Students were informed at the end of the lecture that completion of the survey was
voluntary. Those who did not wish to complete a survey could then leave. Those who were left were given background information regarding the study and survey. The survey also had an information sheet on the front page (see Appendix 1). At the front of each lecture room there was an empty box for students to return their completed surveys on their way out. This ensured that surveys were anonymous, and that individual students’ surveys could not be traced in any way. Administration of the survey took about 15 minutes to complete. After collection of the surveys, academics then sent the completed ones back to the investigator for data analysis.

3.7 DATA ANALYSIS

3.7.1 Data Coding

Once the data were collected they were entered into the ‘Statistical Package for Social Sciences’ (SPSS) software for analysis. This section will discuss, firstly how the data were coded (and recoded), and the preparation for the formal analyses of the data.

3.7.1.1 Demographic Questions

The first section of the instrument included a number of demographic details about the respondents. These data were coded numerically in the following order (only the main categories used for further analyses will be included here):

Gender: was coded 1 (male) or 2 (female).

Age: was coded 1 (under 21), 2 (21-25), 3 (26-35), or 4 (36 or older).

Experience with students with LD: was coded 1 (none), 2 (little), or 3 (lots).

Training to teach: was coded 1 (primary), 2 (secondary), or 3 (other).

Completion of the compulsory Inclusive Education: was coded 1 (yes) or 2 (no).
3.7.1.2 Attributional Vignettes Questions

Section Two of the instrument was the Attribution Vignettes Questionnaire (created initially by Clark in 1997) that consisted of eight vignettes. Following the description of a hypothetical boy were four questions which focused on respondents’ reaction to the vignettes. The four questions were in Likert scale format. Question one looked at the feedback that respondents would give to the hypothetical boy. The scale ranged from +5 (extremely positive) to -5 (extremely negative). As stated earlier there was no neutral zero response included in the scale because the idea was to force respondents to give either positive or negative feedback. However, arguments exist for and against including a neutral zero point (Eysenck, 1998). For example, some researchers argue that some respondents may be neutral and that by not including a neutral point in a scale, the respondent is compelled to make a decision (Kline, cited in Eysenck, 1998). On the other side though, Dumas (1999) argues that the exclusion of a neutral point will draw the respondent to make a decision one way or another, thus providing a better measure of the intensity of participants’ opinions. Another possible cause for concern is that due to not having a neutral zero in the frequency of distribution, it will not be equally sequential and this will affect the skewness and kurtosis of the data (Glass & Hopkins, 1984; Tabachnik & Fidell, 1996).

With these considerations and concerns in mind, it was decided that the neutral zero point of the scale was not to be included in this study. Attribution theory provided the theoretical grounding of the vignettes, and therefore, to gain a conclusive understanding of the respondents’ verbal attributional reaction to students’ failure, it was necessary to elicit either positive or negative feedback only. A neutral point on the scale may have encouraged respondents to answer neutrally, if they were not sure. Excluding the neutral point therefore provided a better measure of respondents’ behavioural reactions.

In order to deal with these concerns about excluding a neutral point, the investigator systematically recoded the feedback scores, thus ensuring that the frequency of distribution was equally sequential. To that end the following recoding took place:
Table 3.7.1. *Recoding of the Feedback Scores*

<table>
<thead>
<tr>
<th>Original Score</th>
<th>New Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>+5</td>
<td>+4.5</td>
</tr>
<tr>
<td>+4</td>
<td>+3.5</td>
</tr>
<tr>
<td>+3</td>
<td>+2.5</td>
</tr>
<tr>
<td>+2</td>
<td>+1.5</td>
</tr>
<tr>
<td>+1</td>
<td>+0.5</td>
</tr>
<tr>
<td>-1</td>
<td>-0.5</td>
</tr>
<tr>
<td>-2</td>
<td>-1.5</td>
</tr>
<tr>
<td>-3</td>
<td>-2.5</td>
</tr>
<tr>
<td>-4</td>
<td>-3.5</td>
</tr>
<tr>
<td>-5</td>
<td>-4.5</td>
</tr>
</tbody>
</table>

This recoding resulted overall in a more normal distribution. Prior to the recoding three variables were of dubious concern, and although all of them improved after the recoding was completed, two were still slightly dubious (see Appendix 3). The original whole numbered scores were left as whole numbers in the carrying out of the survey instrument due to the ease for respondents to interpret the responses. All other questions in the vignettes questionnaire section used a standard seven-point Likert scale response. Question two and three were coded from 1 (very little) through to 7 (very much). Question four was coded from 1 (very unlikely) through to 7 (very likely). No recoding was necessary for these questions.

### 3.7.1.3 Attitude Questions

The Attitude Questionnaire (Section Three of the instrument created initially from the SOP by NRCGT [Tomlinson et al.] 1995) consisted of fifteen attitude statements. Nine of the statements were about attitudes towards differentiating the curriculum, and six were about attitudes towards students with LD. Following each statement
respondents were asked to answer in a five-point Likert scale format, which ranged from 1 (strongly agree) through 3 (don’t know) to 5 (strongly disagree). Initially, statements four and five were the only statements that needed reverse coding as they were in the opposite direction to all of the other statements. However, once factor analysis had been carried out, these statements were later deleted as they did not load substantially on either factor (this will be discussed in the next section). All statements were coded so that the higher the respondent’s score, the more positive attitude they had towards students with LD and differentiating the curriculum.

3.7.1.4 Teacher Efficacy Questions

Section Four of the instrument was the Teacher Efficacy Scale (created initially by Gibson and Dembo (1984), and then modified by Hoy and Woolfolk (1993) to a shortened version), which consisted of ten teacher efficacy statements. Five of the statements were about general teacher efficacy, and five were about personal teacher efficacy. Following each statement, respondents were asked to react to each statement using a six-point Likert scale format, which ranged from 1 (strongly agree) through to 6 (strongly disagree).

<table>
<thead>
<tr>
<th>Original Score</th>
<th>New Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>

Table 3.7.2. Recoding of the Personal Teacher Efficacy Statements

Statements 3, 6, 7, 8, and 9 (personal teacher efficacy) were positive, while the other statements were negative. To make analysis comparisons and create efficacy scores,
statements 3, 6, 7, 8, and 9 (personal teacher efficacy) were recoded (see Table 3.7.2). Thus, the higher the respondents’ score the more efficacious the perceptions of general teacher efficacy and personal teacher efficacy.

3.7.1.5 Instructional Strategies Questions

Finally, the Instructional Strategies Questionnaire (Section Five of the instrument, created initially from the SOP, and the DPS instruments) consisted of twenty instructional strategies. Following each instructional strategy respondents were asked to respond in a five-point Likert scale format as to how frequently they would use each instructional strategy for students with and without LD (two separate columns permitted respondents to rate each instructional strategy twice. See Appendix 1, p. 14). The scale ranged from 1 (never) through to 5 (very frequently). Where a strategy was unfamiliar, respondents were asked not to provide a rating. No recoding was necessary for this section of the questionnaire.

3.7.2 Missing Data and Outliers

Due to the survey instrument incorporating a vast amount of data (N=93 variables), and having a large number of respondents (N=667), there were at times, data missing from respondents’ results. A total of 42 (1.67% of data) respondents for the Section Two vignettes questionnaire, 29 (1.59% of data) respondents for the Section Three attitudes questionnaire, and, 50 (2.70% of data) respondents for the Section Four teacher efficacy scale had at least one missing response (whether it was just one question or many questions unanswered). Section Five (instructional strategies questionnaire) of the instrument asked respondents not to answer the strategies that they were unfamiliar with. Thus data missing in this section were classified as non response data. There were 123 (13.19% of data) respondents for the Section Five instructional strategies questionnaire who had at least one part of the questionnaire unusable.
“Missing data is one of the most pervasive problems in data analysis” (Tabachnik & Fidell, 1996, p. 60). To ensure that the missing data posed no problems in the subsequent analyses, the investigator tested comparisons between the missing and non-missing values, which according to Tabachnik and Fidell (1996), is the most suitable precaution. This was undertaken for each section of the instrument. However, it needs to be noted that although these tests of comparisons were examined on a section by section basis, the contrasts in each case were undertaken on the full variable set. One file was constructed for Sections Two, Three, and Four of the survey (a total of three files). Within each file a variable identifying two groups of respondents was created (missing and non-missing respondents). The investigator carried out independent samples t-test analysis for each section of the instrument (see Appendix 5). This was performed to see whether any significant differences occurred between those with missing and those with non-missing data. Thus, comparisons were examined between the responses of those with complete data sets to the responses of those with any missing data. Therefore it was the non-missing responses of those with missing data which were being investigated.

For example, as can be seen in Appendix 5b, in regards to Section Three (attitudes questionnaire) of the instrument, two groups of respondents were identified. These two groups consisted of respondents who had missing data (N=29) and respondents who had no missing data (N=638). An independent samples t-test analysis was performed across all of the variables to test for significant differences between the two groups. As can be seen in Appendix 5b, there were only two variables that resulted in significant differences (vignette Thomas feedback, \( p = .003 \); attitude statement 1, \( p < .001 \)). When testing a large number of variables for significance, it can be expected that a small percentage of them will result in significant findings (Tabachnik & Fidell, 1996). All other t-tests performed across Sections Two, and Four resulted in non-significant findings, with the exception of one or two variables (see Appendix 5). It was therefore decided that cases that had missing responses were deleted, by using listwise methods in the analyses (section by section).

An independent samples t-test analysis was performed across Section Five (instructional strategies questionnaire) in the same manner as the previous sections. However, the exception to this was that the test was considering comparisons between
response rates and non-response rates. This was due to the instrument asking respondents not to check a strategy if they were not familiar with the strategy. This resulted in a higher non-response rate. Thus, once again, with the exception of one variable (LD students – variety of materials, p = .003), all results showed no significant differences across the variables (see Appendix 5d).

According to Tabachnik and Fidell (1996) if there are only a few data points missing randomly from a large sample size, and these pose no significant differences (or very few from a large pool of variables), as is the case in this study, deleting these cases from further analysis is an acceptable method. From the findings here, it was conclusive to state that when analysing each section of the survey instrument (such as the attributional vignette questionnaire) it was necessary and viable to take (listwise) those respondents who had parts of the vignette questionnaire missing out of the analysis.

Scatter plots of the data were carried out to see if any outliers were present, and if so to decide on whether they should be excluded from the subsequent analysis. Reasons why outliers can be present may vary from incorrect data entry through to being a genuine extreme value (Best & Kahn, 2006; Tabachnik & Fidell, 1996). A small number of outliers were found (0.19%). Only one outlier was found to be due to incorrect data entry, which was rectified.

To test whether the outliers caused any significant differences or problems to the data set, an independent samples t-test analysis was performed. A file was constructed for Sections Two, Three, Four, and Five of the survey (a total of four files). Each file consisted of two sets of data. One set included all of the respondents’ data including the identified outliers. The second set of data included the respondents’ data without the outliers. The investigator carried out independent samples t-tests for each section of the instrument (see Appendix 6). This was performed to see whether any significant differences occurred between including and not including the outliers. If significant differences resulted, careful consideration of what to do with the outliers would be required (Hair, Black, Babin, Anderson & Tatham, 2006).
For example, as can be seen in Appendix 6b, in regards to Section Three (attitudes questionnaire) of the instrument two groups of respondents were identified. One group consisted of respondents who had been identified as having at least one variable data as an outlier in this section included with all of the other respondents (N=667). The other group consisted of all respondents, excluding those identified as outliers in this section (N=661). Thus six outliers were present in this section. An independent samples t-test analysis was performed across all of the attitude variables to test for significant differences between the two groups. As can be seen in Appendix 6b, there were no significant differences. All other t-tests across each of the sections of the survey resulted in non-significant findings (see Appendix 6). However, it needs to be acknowledged that carrying out multiple t-tests with items that are potentially correlated can create the risk of type I error.

As the few outliers (0.19%) identified are only small in number, compared to the sample size and number of variables, and they make no significant differences to the overall sample means, the investigator decided to leave the outliers as they were. This, according to Hair, et al. (2006) was the best method for this study in dealing with outliers.

**3.7.3 Data Normality**

An important assumption in the analysis of covariance and mean structures, and one that is associated with structural equation modelling (which will be discussed), is that the data have a normal distribution (Gravetter & Wallnau, 2002). According to Byrne (2001), skewness and kurtosis information can assist in assessing normality (which is provided in Appendix 4).

Despite the argument about the need for normality, Tabachnik and Fidell (2001) contend that, with reasonably large samples, as is the case for this study, skewness and kurtosis will not make a substantial difference to the analysis. Moreover, although kurtosis can result in an understatement of the variance, this risk is reduced with 200 or more cases (667 in this research). Table 3.7.3 shows the normal results marked *,
using critical values of ± .500 for skewness and ± .701 for kurtosis. Clearly this table supports Tabachnik and Fidell’s argument.

<table>
<thead>
<tr>
<th></th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD Attitude</td>
<td>-.328*</td>
<td>-.232*</td>
</tr>
<tr>
<td>Differentiation Attitude</td>
<td>-.096*</td>
<td>-.237*</td>
</tr>
<tr>
<td>Teacher Efficacy</td>
<td>-.171*</td>
<td>-.020*</td>
</tr>
<tr>
<td>Personal Efficacy</td>
<td>-.027*</td>
<td>-.029*</td>
</tr>
<tr>
<td>NLD Instructional Strategies</td>
<td>-.475*</td>
<td>-.037*</td>
</tr>
<tr>
<td>LD Instructional Strategies</td>
<td>-.128*</td>
<td>-.017*</td>
</tr>
<tr>
<td>Vignette A (Thomas) Feedback</td>
<td>-1.160</td>
<td>1.166</td>
</tr>
<tr>
<td>Vignette A (Thomas) Frustration</td>
<td>1.081</td>
<td>.355*</td>
</tr>
<tr>
<td>Vignette A (Thomas) Sympathy</td>
<td>-.011*</td>
<td>-.814*</td>
</tr>
<tr>
<td>Vignette A (Thomas) Future Failure</td>
<td>.166*</td>
<td>-.590*</td>
</tr>
<tr>
<td>Vignette B (Andrew) Feedback</td>
<td>-1.440</td>
<td>3.942</td>
</tr>
<tr>
<td>Vignette B (Andrew) Frustration</td>
<td>.478*</td>
<td>-.242*</td>
</tr>
<tr>
<td>Vignette B (Andrew) Sympathy</td>
<td>-.265*</td>
<td>-.035*</td>
</tr>
<tr>
<td>Vignette B (Andrew) Future Failure Exp.</td>
<td>-.057*</td>
<td>.156*</td>
</tr>
<tr>
<td>Vignette C (Jeffrey) Feedback</td>
<td>-.101*</td>
<td>-.639*</td>
</tr>
<tr>
<td>Vignette C (Jeffrey) Frustration</td>
<td>-.632</td>
<td>.271*</td>
</tr>
<tr>
<td>Vignette C (Jeffrey) Sympathy</td>
<td>.142*</td>
<td>-.354*</td>
</tr>
<tr>
<td>Vignette C (Jeffrey) Future Failure Exp.</td>
<td>-.470*</td>
<td>.403*</td>
</tr>
<tr>
<td>Vignette D (Steven) Feedback</td>
<td>-.688</td>
<td>.029*</td>
</tr>
<tr>
<td>Vignette D (Steven) Frustration</td>
<td>.309*</td>
<td>-.331*</td>
</tr>
<tr>
<td>Vignette D (Steven) Sympathy</td>
<td>-.198*</td>
<td>-.022*</td>
</tr>
<tr>
<td>Vignette D (Steven) Future Failure Exp.</td>
<td>-.114*</td>
<td>.247*</td>
</tr>
<tr>
<td>Vignette E (Brian) Feedback</td>
<td>-.297*</td>
<td>-.460*</td>
</tr>
<tr>
<td>Vignette E (Brian) Frustration</td>
<td>-.344*</td>
<td>-.503*</td>
</tr>
<tr>
<td>Vignette E (Brian) Sympathy</td>
<td>-.085*</td>
<td>-.282*</td>
</tr>
<tr>
<td>Vignette E (Brian) Future Failure Exp.</td>
<td>-.449*</td>
<td>.048*</td>
</tr>
<tr>
<td>Vignette F (Phillip) Feedback</td>
<td>-.058*</td>
<td>-.553*</td>
</tr>
<tr>
<td>Vignette F (Phillip) Frustration</td>
<td>-.751</td>
<td>.392*</td>
</tr>
<tr>
<td>Vignette F (Phillip) Sympathy</td>
<td>.561</td>
<td>.081*</td>
</tr>
<tr>
<td>Vignette F (Phillip) Future Failure Exp.</td>
<td>.059*</td>
<td>.153*</td>
</tr>
<tr>
<td>Vignette G (Chris) Feedback</td>
<td>-1.201</td>
<td>1.923</td>
</tr>
<tr>
<td>Vignette G (Chris) Frustration</td>
<td>.708</td>
<td>.028*</td>
</tr>
<tr>
<td>Vignette G (Chris) Sympathy</td>
<td>-.329*</td>
<td>-.495</td>
</tr>
<tr>
<td>Vignette G (Chris) Future Failure Exp.</td>
<td>-.135*</td>
<td>.195*</td>
</tr>
<tr>
<td>Vignette H (James) Feedback</td>
<td>-.168*</td>
<td>-.218*</td>
</tr>
<tr>
<td>Vignette H (James) Frustration</td>
<td>-.282*</td>
<td>-.458*</td>
</tr>
<tr>
<td>Vignette H (James) Sympathy</td>
<td>.036*</td>
<td>.049*</td>
</tr>
<tr>
<td>Vignette H (James) Future Failure Exp.</td>
<td>.099*</td>
<td>.074*</td>
</tr>
</tbody>
</table>
3.7.4 Data Sample Comparisons

To analyse the data from respondents, in regards to the vignettes of students with and without LD, through repeated measures analysis (see section 4.3), it was necessary to compare a variety of demographic data to parts of the vignette questionnaire. This was to see whether there were any significant differences among gender, institution, or whether respondents had completed the compulsory inclusive education subject. Logistic regression was carried out by the investigator on the different measures of the vignette questionnaire (frustration, sympathy and failure), using the main demographic groups of respondents (institution, gender and completion of inclusive education). The investigator did not test each potential independent variable (IV) against every measure. Each IV was tested against a measure selected at random (see Appendix 7).

The IVs and dependent measures (DV) that were compared were: gender (IV) and frustration (DV), completion of inclusive education (IV) and sympathy (DV), and, institution (IV) and expectation of future failure/frustration (DV). As Table 3.7.4 shows, there were no significant differences found across any of the logistic regression analyses.

Table 3.7.4. Logistic Regression Results for Vignette Responses

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusive Education</td>
<td>.209</td>
</tr>
<tr>
<td>Gender</td>
<td>.658</td>
</tr>
<tr>
<td>CSUB &amp; CSUW</td>
<td>.930</td>
</tr>
<tr>
<td>UOW &amp; MQU</td>
<td>.641</td>
</tr>
<tr>
<td>CSU &amp; WM</td>
<td>.726</td>
</tr>
</tbody>
</table>
The logistic regression on institutions was carried out in three parts as there were four institutional campuses that were used in the survey. Firstly, a comparison was carried out between Charles Sturt University (CSU) Bathurst campus and CSU Wagga Wagga campus. No significant differences were found (p = .930), thus one group variable (CSU) was created between CSU Bathurst and CSU Wagga Wagga. Secondly, a comparison was carried out between University of Wollongong (UOW) and Macquarie University (MQU). Once again there were no significant differences found (p = .641), thus one group variable (WM) was created between UOW and MQU. Finally, a comparison was carried out between the combined group, consisting of all CSU respondents, and the combined group consisting of UOW and MQU respondents. Once again, there were no significant differences found (p = .726). For parts one and two the DV used was expectation of future failure. However, to make sure that the results were more valid and conclusive, part three used frustration as the DV.

From each logistic regression carried out, there were no significant differences found on each case (see Appendix 7). Thus, it is legitimate to treat the sample for this part of the data analysis as coming from a single population, viz., New South Wales preservice teachers.

3.7.5 Data Consolidation

Due to the large number of variables included within the survey questionnaire instrument (N = 93), it was not viable to analyse all variables independently. Thus, Sections Three (attitude questionnaire), Four (teacher efficacy scale), and Five (instructional strategies) as mentioned throughout the methodology chapter, required reduction of the number of variables. The aim was to create a smaller number of factors which concisely describe (and reveal) the relationships among the observed variables. Since the purpose of factor analysis is to reduce the number of variables by linking variables together, any variables, which show no substantial correlation with any of the others, are removed from further analyses. In order to achieve this aim, factor analysis was used to create a smaller number of factors for each section of the instrument. Previous studies had created and/or modified the SOP and TES
instruments used in this current survey, and had identified independent dimensions from the variables. However, it was necessary in this study to carry out a factor analysis for Sections Three (attitude questionnaire), Four (teacher efficacy scale), and Five (instructional strategies) of the instrument. This approach recognised the different samples and time frames of the current study.

In regards to Section Three, factor analysis, using principal components extraction and Varimax rotation, in the sample from this study produced two independent dimensions: attitudes towards students with LD, and attitudes towards differentiating the curriculum. However, not all of the variables loaded satisfactorily on to either dimension. The current study initially included nine statements of attitudes towards differentiating the curriculum, and six statements of attitudes towards students with LD from the original instrument. However, only six of the original nine statements of attitudes toward differentiating the curriculum, and five of the original six statements of attitudes toward students with LD loaded substantially onto either dimension.

Factor analysis, using principal components extraction and Varimax rotation, initially produced four independent factors. One factor consisted of the six statements regarding attitudes towards differentiating the curriculum; another factor consisted of the five statements regarding attitudes towards students with LD; and, the two other factors consisted of four statements (two per factor). These four statements were deleted from the analysis. Thus, the current study through factor analysis resulted in two attitudinal independent factors, using eleven of the original fifteen variables. Four variables (statements 2, 4, 5, and 15) were deleted from the original instrument for the analysis. The two independent factors resulted in alpha coefficient scores of .650 (6 items) and .674 (5 items) respectively (see Appendix 8).

Previous studies that have used Hoy and Woolfolk’s (1993) shortened version of the TES have generally found that the ten variables load on to two independent factors (general teacher efficacy and personal teacher efficacy). For this study, factor analysis, using principal components extraction and Varimax rotation, was again carried out on the teacher efficacy scale statements. This produced two independent factors. Five of the statements, which theoretically relate to general teacher efficacy, loaded on to one factor; and the other five statements, which theoretically relate to personal teacher efficacy, loaded onto the second factor. These two independent
factors resulted in alpha coefficient scores of .66 2 (5 items) for general teacher efficacy, and .674 (5 items) for personal teacher efficacy (see Appendix 8).

The previous studies in which the instructional strategies questionnaire was formed (SOP created by NRCGT [Tomlinson et al., 1995; DPS created by Hootstein, 1999) were created to analyse the instructional strategies individually by looking at either strategies in comparison to one another (Hootstein, 1999), or strategies in comparison to different types of students (NRCGT [Tomlinson et al., 1995). The current study included twenty varied instructional strategies across two different groups of students (LD and NLD students). The investigator sought to explore (a) which instructional strategies preservice teachers would use, for students with and without LD, and how frequently they believed that they would use the strategies; and, (b) if the instructional methods used for students with LD vary due to their attitudinal and efficacious levels. This latter aim required factor analysis to explore key groups of instructional strategies for analysing with the other theoretical components.

Factor analysis from the sample in this study produced a large number of factors (n=11) from the twenty instructional strategies used in two different contexts (n=40 variables). It is worth noting that even though the number of factors was large, due to the size of the sample (n=667), it was nonetheless adequate for the number of measures in the factor analysis. However, two of the independent dimensions surprisingly were created identifying two clear factor loadings of groups of instructional strategies. One of the independent dimensions that the factor analysis created was what the investigator termed, ‘LD instructional strategies’. This dimension included five distinctly higher cognitive level instructional strategies used specifically for students with LD. The five instructional strategies that the factor analysis identified included: higher-level thinking, independent study, problem-solving, student-led discussions, and independent projects. Conversely, the second independent dimension that the factor analysis created was, what the investigator termed ‘NLD instructional strategies’. This dimension included the same five higher cognitive level instructional strategies as the previous dimension had found, but for NLD students. Thus, the two factors are concomitant with one another.
For the formal analysis of the possible correlations and relationships between attitudes, teacher efficacy, and the instructional strategies that can result from these, the two factors of LD instructional strategies and NLD instructional strategies were used. These two factors represent the higher cognitive level instructional strategies. The literature and previous research has shown that this can be at the heart of the issues surrounding teachers’ knowledge and understanding of students with LD and the techniques and strategies that they use, or do not use, within the classroom context. The two independent factors resulted in alpha coefficient scores of .707 (5 items) and .770 (5 items) respectively (see Appendix 8).

3.7.6 Analysis Design

Due to the fact that the survey instrument used four questionnaires that were created and validated prior to this study, the data collected incorporated interval (Sections Two and Three) and ordinal (sections Four and Five) data. It was decided that although part of the data was ordinal, parametric methods would be used at times. There is controversy in treating ordinal scales as interval scales (Jamieson, 2004). However, Knapp states that there is merit in the argument that sample size and distribution are more important than level of measurement in regards to determining the appropriateness of using parametric statistics (1990). Parametric methods are generally ‘robust’, more powerful than non-parametric methods, and “unless the results are very highly skewed, almost all statisticians will be comfortable using parametric methods on such data set” (Guyatt, Haynes & Sockett, 2006). As table 3.7.3 shows, all of the ordinal data verify an acceptable skewness (< +/- .500) where data are evenly distributed. Thus, according to Guyatt et al. (2006) treating the data as continuous (using parametric analysis) will make the results clearer and easier to understand.

3.7.6.1 Stages of Analysis

As can be seen in Figure 3.7.6 the complex nature of the analysis procedure in regards to testing the hypotheses occurred in six stages. This section will discuss each
hypothesis in relation to the varied analyses and comprehensive stages of analysis which will be presented and discussed in the following chapter.

Stage one of the analysis procedure carried out general descriptive analyses of the demographic details of the sample of this study. This was to gain a representation of the respondents in the sample of the study.
Demographics
- Descriptive Analysis

Attributions
- Repeated Measures
- t-test

Teacher Efficacy
- MANOVAs

Attitudes
- MANOVAs

Inst. Strategies
- MANOVAs
- t-test

Correlations
- Correlation Matrix

LD Att & Inst. Strat
- MANOVAs

Attributions & Teach. Eff./Attitudes
- MANOVAs

SEM
- 115 -

Figure 3.7.6. Methodology Analysis
3.7.6.1.1 Statistical Protocols Relating to Each Hypothesis

Hypothesis 1, which states, “Preservice teachers within Australia: will be more positive and less negative towards students with LD than students without LD; will feel less frustration towards students with LD than students without LD; will feel greater sympathy towards students with LD than students without LD; and, will hold a greater expectation of future failure for students with LD than students without LD”, was investigated using repeated measures and t-tests (see stage two in Figure 3.7.6). A 2 (ability) by 2 (effort) by 2 (N/LD status) multivariate analysis of variance (MANOVA) with repeated measures was conducted for each dependent measure (feedback, frustration, sympathy, and expectancy of future failure). The repeated measures analysis was carried out to compare the attributional responses towards students with and without LD, students of high and low ability, and, students who expend high and low effort. This was to find out whether any significant attributional differences exist with the way in which preservice teachers respond. As the logistic regression analysis (discussed earlier in preparation for the formal analysis) found that there were no significant differences amongst the demographic groups of respondents, repeated measures analysis of the complete sample was appropriate. A paired sample t-test approach was used to compare the responses to the hypothetical students with LD with the responses to their counterparts without LD. This was to identify any significant differences that exist and their magnitude. Each LD vignette was matched to its NLD counterpart for ability level and amount of effort expended. Thus, there were four pairs of vignettes that were tested for possible significant differences across the four response variables (i.e. a total of sixteen t-tests were carried out).

Hypothesis 2, which states, “Preservice teachers would use different instructional strategies at different frequencies for students with LD in comparison to students without LD”, was investigated using a paired sample t-test approach (see stage two in Figure 3.7.6). A paired sample t-test approach was used to compare instructional strategies that preservice teachers would use for students with LD to students without LD. This was to examine whether any significant differences exist and their magnitude. Each LD instructional strategy was paired with its NLD instructional strategy counterpart. Thus, there were twenty pairs of instructional strategies that
were tested for possible significant differences with appropriate procedures to avoid type I error.

Hypothesis 3, which states, “Compulsory inclusive education subjects at tertiary institutions significantly influence preservice teachers’ attitudes towards students with LD and differentiation of the curriculum, teacher efficacy, and perceived use of instructional strategies for students with LD”, was investigated using MANOVA, logistic regression (as previously discussed) and structural equation modelling approaches. Three MANOVAs were performed across Sections Three (attitudes), Four (teacher efficacy), and Five (instructional strategies) of the instrument (see stage two in Figure 3.7.6). The dependent variables (attitude, teacher efficacy, and, instructional strategies) were tested against the independent variable (completion of inclusive education) to see whether any significant differences exist, and their nature. The three MANOVAs were also carried out with only males/females included to see whether there were any significant gender differences. Logistic regression was also carried out (as discussed earlier in the preliminary preparation analyses) to test for possible significant differences in attributional responses. Once again, the independent variable was completion of inclusive education, while the dependent variables were the sixteen vignette responses. Stage six of the analysis procedure examined the multiple relationships between preservice teachers’ attitudes, teacher efficacy, attributional responses and instructional strategies used. A group Structural Equation Model (SEM) was carried out to compare the multiple relationships of the observed variables and latent (unobserved) variables between respondents who had and had not completed the compulsory subject. Thus, the final structural model developed used the group of respondents who had completed a compulsory inclusive education subject as one sample group. The group of respondents who had not completed a compulsory inclusive education subject were used as the comparison group of respondents. The SEM analysis will be discussed in detail in section 3.7.6.2.

Hypothesis 4, which states, “There is a positive correlation among preservice teachers’ attitudes towards students with LD, their attitudes towards differentiating the curriculum, and their teacher efficacious levels”, was investigated using a correlation matrix (see stage four of the analysis procedure). Stage four of the analysis procedure examined the relationships between preservice teachers’ attitudes and their
teacher efficacy levels. A correlation matrix was created and examined. A four-by-four correlation matrix of the scale variables (created through factor analysis discussed earlier) was produced to examine the intercorrelations between the variables. Correlation matrices between the individual variables that make up the scale variables were also created to see whether any positive or negative intercorrelations co-existed between the specific individual variables. The correlations between the variables, as well as the significant levels, were evaluated. The correlations between preservice teachers’ attitudes and teacher efficacy were also considered as part of the overall development of the structural models in the structural equation modelling analyses (see section 3.7.6.2).

Hypothesis 5, which states, “Preservice teachers’ attitudes and teacher efficacious levels are predictive of their preferred instructional strategies for students with LD”, was investigated using a MANOVA approach (see stage three of the analysis procedure), and structural equation modelling (see stage six of the analysis procedure). Stage three of the analysis procedure performed a MANOVA to examine whether preservice teachers’ frequency of instructional strategies (used for students with LD) differed between those with a positive attitude and those with a negative attitude towards students with LD. Prior to carrying out the MANOVA, the data set had to be prepared. High and low groups were selected for the ‘LD attitude’ variable, which were used for the MANOVA. In general, approximately 20% of the highest and a similar percentage of the lowest were selected (depending on the natural cut-offs) for the MANOVA contrast. Table 3.7.6 shows the number and percentage of respondents used for this MANOVA (LD Attitude). Structural Equation Modelling (SEM) was carried out to explore the theoretical relationships between preservice teachers’ attitudes and teacher efficacy, and how they influence the instructional strategies that they would use for students with LD. The SEM analysis will be discussed in detail in section 3.7.6.2.

Hypothesis 6, which states, “The responses that preservice teachers give students with LD (feedback, frustration, sympathy, and expectation of future failure) differ due to their attitudes and teacher efficacious levels towards students with LD”, was investigated using a MANOVA approach (see stage five in Figure 3.7.6) and structural equation modelling (see stage six in Figure 3.7.6).
Stage five of the analysis procedure investigated preservice teachers’ attitudes, teacher efficacy, and the possible differences and relationships that they have with attributional responses to students with and without LD. A MANOVA analysis was performed to examine whether preservice teachers’ attributional responses to students with and without LD differed between, for example, those who had high positive and those who had low negative attitudes towards students with LD. Prior to carrying out the MANOVA analyses, the data set had to be prepared in the same manner as for the previous hypothesis (see Table 3.7.6).

Table 3.7.6. Number and Percentage of Respondents used for Each MANOVA

<table>
<thead>
<tr>
<th></th>
<th>High Level</th>
<th></th>
<th>Low Level</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>Score</td>
<td>N</td>
</tr>
<tr>
<td>LD Attitude</td>
<td>98</td>
<td>15.9</td>
<td>4.20 – 5.0*</td>
<td>94</td>
</tr>
<tr>
<td>Diff Attitude</td>
<td>130</td>
<td>22.2</td>
<td>4.17 – 5.0*</td>
<td>136</td>
</tr>
<tr>
<td>Teacher Efficacy</td>
<td>111</td>
<td>18.3</td>
<td>4.60 – 6.0*</td>
<td>111</td>
</tr>
<tr>
<td>Personal Efficacy</td>
<td>143</td>
<td>23.5</td>
<td>4.80 – 6.0*</td>
<td>118</td>
</tr>
</tbody>
</table>

* = Scores shown are inclusive

Table 3.7.6 shows the number and percentage of respondents used for each MANOVA. Four separate MANOVAs were conducted with the sixteen vignette responses to test for significant differences. Structural Equation Modelling (SEM) was carried out to explore the multiple relationships between preservice teachers’ attitudes and teacher efficacy. It also examined how they influence the attributional responses that preservice teachers give for students with LD. The SEM analysis will be discussed in detail in section 3.7.6.2.
3.7.6.2 Structural Equation Modelling

Structural Equation Modelling (SEM) is a statistical technique used to test hypotheses about relationships between observed variables and latent or unobserved variables (Byrne, 2001). SEM was chosen for this data analysis because (i) it can provide a means of dealing with multiple relationships (including interrelated ones) simultaneously (Raykov & Marcoulides, 2000); and, (ii) it can accommodate unobserved (latent) variables and give reasons for measurement error in determining the relationship estimates (Byrne, 2001).

A full structural equation model comprises two components: a measurement model that depicts the relationships between the latent (unobserved) variables and their observed indicators; and a structural model that measures the relationships between the latent variables (Byrne, 1998). According to Schumacker and Lomax (2004), SEM methods are becoming a more favourable method of confirming or disconfirming theoretical models in a quantitative fashion.

The structural equation modelling software package, AMOS 6, was used to test the fit of the model to the data because of its wide acceptance and diagrammatic implementation, making it easily comprehensible. A further strength of using AMOS is that it allows a researcher to fit a model to a covariance matrix (rather than a correlation matrix) which is likely to ensure more accurate estimates, but with a sacrifice of some ease of interpretation.

According to Bollen and Long (1993) structural equation modelling is comprised of five stages: model specification, identification, estimation, testing fit, and respecification. Hair et al. (2006) outlined six stages of the process for SEM (similar to Bollen and Long’s five stage process). These include: define the individual measures, develop and specify the measurement models, design the study, assess the measurement model validity, specify the structural models, and assess the structural models. The approach that this study adopted was similar to the above approaches, and consisted of six stages. Firstly, the study defined the measurement models from theory and previous empirical research; secondly, the study developed and specified
each of the measurement models; thirdly, the study tested each measurement model; fourthly, the structural models were developed; fifthly, the structural models were then tested; and, finally post-hoc analysis was carried out to test the validity and reliability of the final structural model.

3.7.6.2.1 Data Preparation for the SEM

A number of processes needed to be carried out prior to the commencement of the SEM analysis. This included: deleting the unusable (incomplete) data sets, splitting the sample (and analysing the two samples to make sure that there are no significant differences), and factor analysis (of the vignette measures).

The issue of missing data needed to be addressed prior to the implementation of the model. This is because AMOS 6 requires a full data set to analyse in order to develop models. Even though AMOS provides a means by which missing data might be treated, it was decided that the respondents who had any missing data would be deleted for the SEM analysis. This was due to the fact that previously (as discussed earlier) missing data had been rigorously analysed and tested and no significant differences across the measures and scaled variables were found between the missing and completed data sets. Thus the total sample size for analysis by the SEM technique was 480 cases.

After deleting unusable cases, the data were then randomly split into two samples (each N = 240) using the ‘Selected Cases’ command in SPSS 14.0. This was so that a cross-validation analysis could be conducted using one sample for model development and the other sample for validation and model testing. This was done for several reasons. Firstly, according to Byrne (2001) a sample size of around 200 is an ideal size for SEM. Secondly, as the model is not only a confirmatory, but also an exploratory approach to analysis, problems can arise in regards to post hoc model fitting. Thus, it was necessary to carry out a cross validation whereby the final model could be re-tested with another set of data (a second sample) from the same population (Anderson & Gerbing, 1988; Byrne, 2001). Once the ‘Selected Cases’ command had randomly selected 50% of the sample, it was necessary to analyse and
test the two samples to make sure there were no significant differences between the two groups. This was done by carrying out MANOVAs across each of the sets of variables. The two samples that were selected by the SPSS ‘Selected Cases’ command had no significant differences amongst any of the variables used in the SEM (see Appendix 9).

The final step needed prior to commencement of SEM analysis was to create factor variables amongst the vignettes. From the original 32 variables from the eight vignettes (of which half were LD), those variables that related to the LD vignettes only (16 of the variables) were computed through factor analysis. It was required that the number of variables be reduced to a smaller number of factors to concisely describe the relationships among observed variables. Since the purpose of factor analysis is to reduce the number of variables by way of linking them together, those variables with a poor loading (less than 0.3 according to Coakes & Steed, 2003; and Tabachnik & Fidell, 1996), were deleted from scales using this criterion. In order to do this, the investigator used factor analysis to create a smaller number of factors regarding the vignette variables.

The investigator carried out a factor analysis with all 16 variables. This produced four independent dimensions of feedback, frustration, sympathy and future expectation of failure. The investigator then took the four feedback variables and carried out a further factor analysis, in which case they all loaded onto one factor. The investigator then did the same with the other three independent dimensions and the same findings occurred. As Table 3.7.6.2 shows, the reliability was tested for each of the four independent dimensions and all were acceptably reliable. It is also worth noting that all of the factor loadings were above the accepted 0.3 (Coakes & Steed, 2003; Tabachnik & Fidell, 1996), thus none of the individual variables were deleted from the independent dimension. When computing the four individual variables (from each LD vignette) into one factor variable (such as feedback), the investigator included the factor loadings of each individual variable into the variance of loading of the factor variable (see Appendix 10).
Table 3.7.6.2. **Reliability from the Individual Factor Variables**

<table>
<thead>
<tr>
<th>Factor Variable Name</th>
<th>Cronbach’s Alpha Based on Standardised Weight Scores</th>
<th>N of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedback</td>
<td>.771</td>
<td>4</td>
</tr>
<tr>
<td>Frustration</td>
<td>.701</td>
<td>4</td>
</tr>
<tr>
<td>Sympathy</td>
<td>.756</td>
<td>4</td>
</tr>
<tr>
<td>Failure</td>
<td>.612</td>
<td>4</td>
</tr>
</tbody>
</table>

3.7.6.2.2 The Conceptual Model

Figure 3.7.6.2 presents a conceptual model illustrating graphically the relationships to be evaluated in the study using SEM. The relationships in this model are based on the research, theoretical frameworks, and literature discussed in the previous chapters.

The proposed model presents the direct and indirect effects of attitudes and teacher efficacy on attributional responses to students’ performance and instructional strategies perceived to be used in the classroom for students with LD. The conceptual model is proposed and tested based on the following hypotheses:

**H4.** There is a positive correlation among preservice teachers’ attitudes towards students with LD, their attitudes towards differentiating the curriculum, and their teacher efficacious levels.

**H5.** Preservice teachers’ attitudes and teacher efficacious levels are predictive of their preferred instructional strategies for students with LD.

**H6.** The responses that preservice teachers give students with LD (feedback, frustration, sympathy, expectation of future failure) differ due to their attitudes and efficacious levels towards students with LD.
3.7.6.2.3 The Development of the Measurement Models

Prior to attempting to create a full structural model it was necessary to construct measurement models which derived from the literature and are represented by latent variables produced from the measured indicators. The five latent variables and their respective indicator measures were: LD attitude, differentiation attitude, general teacher efficacy, personal teacher efficacy, and, higher cognitive level instructional strategies (see Figures 4.10.1 – 4.10.5 respectively). From the factor analysis carried out earlier in the analysis process, the latent variables were included in the SEM with their respective indicator measures.

3.7.6.2.4 The Development of the Structural Models

Once each of the measurement models was created, the investigator then developed a combined model comprised of the two attitude measurement models, and the two teacher efficacy measurement models (see Figure 4.10.8).

Once a model including these latent variables and their indicators was produced, three structural equation models were examined: the first model comprised the combined model (above) and the higher cognitive level instructional strategies measurement model (see Figure 4.10.9); the second model comprised the attitude and teacher efficacy combined model and the attributional response variables (see Figure 4.10.10); and, the final overall model comprised all of the variables together (see Figure 4.10.11).
Figure 3.7.6.2. Hypothesised SEM Model from Theoretical Research
3.7.6.2.5 Post-Hoc Analysis

Models, which incorporate confirmatory and exploratory approaches, should always be considered as a tentative solution since re-specifications of the model may be due to circumstances related to that specific data set (Hoyle, 1995). Post-hoc analyses allow for further confirmation of variable means to effect.

3.7.6.2.5.1 A Cross-Validation Analysis Using Sample Two

An approach for addressing these post-hoc model fitting issues has been suggested by Byrne (2001) which involves an invariance-testing strategy that tests for replicability of structural paths across groups. This strategy involves cross-validating the findings by randomly splitting the data set into two groups, where one set is used to develop the model, and the second set is used to test and validate the model (Cudeck & Browne, 1983). As discussed, the ideal sample size to use for SEM is around 200. As this study had 480 respondents for the SEM, the investigator was able to split the sample into two groups (n=240). This helped support the post-hoc analysis for validity of the model greatly (Byrne, 2001). When the final model was determined the fit was confirmed by using a second set of data.

3.8 CHAPTER SUMMARY

The methodology used in this study of preservice teachers’ perceptions and expectations of students with LD involved the collection of data from preservice teachers at four university campuses across the state of NSW. This chapter has discussed the purpose and design of the research study, the sample and population of respondents used for the study, the survey instrument used to collect the data, the procedure for collection of data, and the process of analysis carried out. The hypotheses that were tested in this research are based on the theoretical research and literature discussed in the previous chapter.
Chapter 4 reports the results of the data analysis. The results chapter presents the findings from the data analysis in the following key areas:

- Attributional vignette responses
- Attitudes
- Teacher efficacy
- Instructional strategies
- Attitude and teacher efficacy correlations
- Effects of attitudes and teacher efficacy on attributional responses
- Structural equation modelling
CHAPTER 4 – RESULTS

4.1 INTRODUCTION

The purpose of this chapter is to present the results of the analyses of the data in this study. These results are presented by firstly giving an overview of the general characteristics of the sample used. Then the results from the individual components of the survey are examined. The findings from the attribution vignettes, which explored the responses between those with and without LD through a MANOVA of repeated measures analysis, are discussed. The attitudes preservice teachers have towards students with LD and differentiating the curriculum for diverse learners, along with general and personal teacher efficacy, are evaluated. These analyses examine differences between the main groups (independent measures) within the sample (gender, completion of inclusive education and prior LD experience) through MANOVA approaches. The results from the component of instructional strategies perceived to be used for students with and without LD are then presented using a variety of analyses. These include the examination of differences between the main groups (independent measures) within the sample through a MANOVA approach, followed by the comparisons of instructional strategies perceived to be used for students with and without LD through a paired t-test analysis. Finally, a MANOVA approach, comparing preservice teachers who have positive versus negative attitudes towards students with LD, is presented examining differences in the instructional strategies intended to be used for students with LD.

Further significant relationships and differences between the attributional vignette responses of students with LD, attitudes, teacher efficacy, and instructional strategies preservice teachers would use, are then examined. Firstly, correlations between the attitude and teacher efficacy components are evaluated and discussed using correlation matrices. A MANOVA is used to examine differences between preservice teachers with positive and negative attitudes, and those with high and low teacher efficacy levels, and their attributional responses to those with LD.
Finally, the chapter identifies a structural equation model for testing the hypotheses about relationships between preservice teachers’ attitudes, teacher efficacy, attributional responses, and the instructional strategies that they would employ for students with LD. The chapter presents the initial measurement and structural models developed, and discusses the findings from the final structural model.

### 4.2 CHARACTERISTICS OF THE SAMPLE

#### 4.2.1 Composition of Sample by Gender

As Figure 4.2.1 shows, 22% of respondents were male and 78% were female. This corresponds with NSW figures that indicate 24% of all teachers are male and 76% are female (Hon John Anderson, 2004). Seventeen percent of primary school preservice teachers in the study were male, while 83% were female. Again, this corresponds with NSW figures indicating that 21% of primary school teachers are males and 79% are females (Callan, 2004). In the secondary school sector, 36% of the preservice teachers in the study were males and 64% were females. This is similar to the figures in NSW in which 45% of secondary school teachers are males and 55% are females (Callan, 2004).

**Figure 4.2.1. Gender Characteristics**

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sample NSW</td>
<td>Sample NSW</td>
<td>Sample</td>
</tr>
<tr>
<td>Prim</td>
<td>86 17.4%</td>
<td>407 82.6%</td>
<td>493</td>
</tr>
<tr>
<td>Sec</td>
<td>56 36.4%</td>
<td>98 63.6%</td>
<td>154</td>
</tr>
<tr>
<td>Other</td>
<td>1 12.5%</td>
<td>7 87.5%</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>143 21.8%</td>
<td>512 78.2%</td>
<td>655</td>
</tr>
</tbody>
</table>

*1 = Figures from Callan, 2004.
4.2.2 Composition of Sample by Age

The participants in the survey had a mean age of between 21-25 years. These correspond with the average age of students across the NSW universities in the study (see Figure 4.2.2). Participants from CSU Bathurst and CSU Wagga Wagga campuses averaged between 21-25 years of age, which according to the Spennemann report (2004) matches CSU’s average student age (22 for females and 23.3 for males at Bathurst campus; 22.9 for females and 23.5 for males at Wagga Wagga campus). Participants from UOW were also between 21-25 years of age and corresponded to UOW’s average student age (UOW annual report, 2005). Participants from MQU included 60% who were under the age of 25 years. The current study was similar in that 59% of respondents were 25 years of age or younger.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>UOW</th>
<th>MQU</th>
<th>CSUB</th>
<th>CSUW</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;21</td>
<td>88</td>
<td>18</td>
<td>102</td>
<td>67</td>
<td>275</td>
</tr>
<tr>
<td>21-25</td>
<td>111</td>
<td>30</td>
<td>72</td>
<td>39</td>
<td>253</td>
</tr>
<tr>
<td>26-35</td>
<td>20</td>
<td>20</td>
<td>22</td>
<td>12</td>
<td>74</td>
</tr>
<tr>
<td>35&gt;</td>
<td>22</td>
<td>14</td>
<td>11</td>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>241</td>
<td>82</td>
<td>207</td>
<td>121</td>
<td>652</td>
</tr>
<tr>
<td>Missing</td>
<td>6</td>
<td>-</td>
<td>3</td>
<td>6</td>
<td>15</td>
</tr>
</tbody>
</table>

Figure 4.2.2. Age Characteristics
4.2.3 Composition of Sample by LD Experience

Overall, the majority of the participants in the study had little previous experience with students with LD (67%). Twenty-six percent of respondents had no previous experience of students with LD, and only 7% had a great deal of prior experience (see Figure 4.2.3). Experience of children with LD did not correspond with age of participants, nor did it correspond with the institution that participants were from, as findings were similar across all campuses and across all ages (see Appendix 11).

<table>
<thead>
<tr>
<th>Experience Level</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>169</td>
<td>25.9%</td>
</tr>
<tr>
<td>Little</td>
<td>437</td>
<td>66.9%</td>
</tr>
<tr>
<td>Lots</td>
<td>47</td>
<td>7.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>653</td>
<td>100%</td>
</tr>
<tr>
<td><strong>Missing</strong></td>
<td>14</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

Figure 4.2.3. LD Experience Characteristics

4.2.4 Composition of Sample by Completion of Inclusive Education

Figure 4.2.4 shows that 42% of respondents had completed the compulsory inclusive education subject that is covered in all university courses as a requirement from the Department of Education and Training (DET). In comparison, 58% of respondents had not yet completed the subject. CSU Bathurst (47% had completed and 53% had not completed) and UOW (37% had completed and 63% had not completed) had a
closer spread of respondents who had and had not completed the compulsory inclusive education subject at their institutions than did CSU Wagga Wagga (11% had completed and 89% had not completed) and MQU (93% had completed and 7% had not completed). These subtle differences did not cause any statistical differences in any of the analyses, which will be discussed in due course, as there were no significant differences across the research sites.

<table>
<thead>
<tr>
<th>Institution</th>
<th>Completed</th>
<th>Uncompleted</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSU B</td>
<td>97</td>
<td>46.9%</td>
<td>110</td>
</tr>
<tr>
<td>CSU WW</td>
<td>13</td>
<td>10.6%</td>
<td>110</td>
</tr>
<tr>
<td>UOW</td>
<td>90</td>
<td>37.3%</td>
<td>151</td>
</tr>
<tr>
<td>MQU</td>
<td>75</td>
<td>92.6%</td>
<td>81</td>
</tr>
<tr>
<td>Total</td>
<td>275</td>
<td>42.2%</td>
<td>377</td>
</tr>
</tbody>
</table>

Missing: 15

Figure 4.2.4. Inclusive Education

4.3 ATTRIBUTIONAL VIGNETTE RESPONSES

A 2 (N/LD status) by 2 (ability) by 2 (effort) multivariate analysis of variance with repeated measures was conducted for the four dependent measures (feedback, frustration, sympathy, and expectation of future failure). Paired samples t-tests were also executed, matching all LD vignettes with their NLD counterparts (e.g. LD high effort, low ability vignette matched with NLD high effort, low ability vignette). This was to examine the most extreme differences using t-values and a Bonferroni adjusted significance of .002.
The following sections report the results of the repeated measures and t-test analyses for feedback, frustration, sympathy, and expectation of future failure. Each section reports the results of the repeated measures analysis by discussing the main effects for each variable (LD status, ability level, and effort expended) and combined interactions. Each section then reports the results from the t-test analysis by discussing the extent of the major differences amongst the vignettes using the t-values.

Overall, significant main effects, from the multivariate analysis of variance repeated measures, for LD status, $F(1, 625) = 153.628, p< .001, \eta^2 = .497$; ability, $F(1, 625) = 189.054, p< .001, \eta^2 = .549$; and, effort, $F(1, 625) = 565.978, p< .001, \eta^2 = .785$, were found for attributional responses (see Table 4.3). Effort resulted in the greatest main effect for attributional responses. In particular, although a three-way interaction of LD, ability and effort was significant, $F(1, 625) = 14.826, p< .001, \eta^2 = .087$, it was LD status and effort that produced the greatest interaction effects, $F(1, 625) = 143.375, p< .001, \eta^2 = .480$. The following sections (4.3.1 – 4.3.4) report the univariate analysis of variance using repeated measures for each individual attributional response.
### 4.3.1 Feedback

Table 4.3.1. Preservice Teachers’ Feedback to Boys with and without LD

<table>
<thead>
<tr>
<th></th>
<th>LD</th>
<th>NLD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SE</td>
</tr>
<tr>
<td>LD Status</td>
<td>2.411</td>
<td>.047</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Ability</td>
<td>2.346</td>
<td>.050</td>
</tr>
<tr>
<td>Effort</td>
<td>1.410</td>
<td>.063</td>
</tr>
<tr>
<td>LD*Ability</td>
<td>2.438</td>
<td>.053</td>
</tr>
<tr>
<td>LD*Effort</td>
<td>1.745</td>
<td>.062</td>
</tr>
<tr>
<td>LD<em>Ability</em>Effort</td>
<td>1.706</td>
<td>.073</td>
</tr>
<tr>
<td></td>
<td>1.252</td>
<td>.077</td>
</tr>
</tbody>
</table>

A significant main effect for LD status, F (1, 625) = 133.48, p < .001, $\eta^2 = .176$, was found for feedback. As Figure 4.3.1 and Table 4.3.1 show, this can be noticed in the $\eta^2$ and mean score differences between feedback given to the LD and NLD students ($M_1 - M_2 = .345$). Consequently, greater positive feedback was given to the LD students. A significant main effect for ability, F (1, 625) = 49.38, p < .001, $\eta^2 = .073$, was also found for feedback. However, the main effect for ability level was not as high as LD status. This can be seen in the differences in feedback between the $\eta^2$ and mean scores of low and high ability students ($M_1 - M_2 = .216$). Therefore, greater positive feedback was given to the low ability students. Finally, a significant main effect for effort, F (1, 625) = 967.74, p < .001, $\eta^2 = .608$, was found for feedback. The level of effort expended was the most highly significant main effect found for feedback. This can be seen in the $\eta^2$ and mean feedback scores given to low effort students ($M = 1.410$) and high effort students ($M = 3.066$). Thus, substantially greater positive feedback was given to students who expend high effort.
Figure 4.3.1. Preservice Teachers’ Feedback to Students

**Figure 4.3.1a**

**Feedback**

<table>
<thead>
<tr>
<th>Effect</th>
<th>$\eta^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD$^3$Ability$^4$Effort</td>
<td>.006*</td>
<td>.056*</td>
</tr>
<tr>
<td>LD$^3$Effort</td>
<td>.172</td>
<td>.000</td>
</tr>
<tr>
<td>LD$^3$Ability</td>
<td>.047</td>
<td>.000</td>
</tr>
<tr>
<td>Effort Expended</td>
<td>.608</td>
<td>.000</td>
</tr>
<tr>
<td>Ability Level</td>
<td>.073</td>
<td>.000</td>
</tr>
<tr>
<td>LD Status</td>
<td>.176</td>
<td>.000</td>
</tr>
</tbody>
</table>

* = Not Significant
Even though ability produced the lowest main effect (compared with LD status and effort), preservice teachers did consider both a boy’s level of ability and his LD status $F(1, 625) = 30.64, \ p< .001, \ \eta^2 = .047$, when giving feedback. As can be seen in Figure 4.3.1b, LD status was particularly influential with high ability students. Thus, high ability students with LD received considerably greater positive feedback than their high ability NLD counterparts. Moreover, it was the effort expended by the student and his LD status that appeared to most strongly influence feedback given, $F(1, 625) = 129.81, \ p< .001, \ \eta^2 = .172$. As can be seen in Figure 4.3.1c, LD status was particularly influential for students who expend low effort. Thus, students with LD who expend low effort received considerably greater positive feedback than their NLD counterparts who expend low effort. Thus feedback for test failure was governed by both the students’ level of ability and the amount of effort they expend, with preservice teachers’ knowledge of a child’s LD status having a mediating influence on the feedback given (see Appendix 12a).

As seen in Figure 4.3.1, preservice teachers’ knowledge of a student’s learning disability can be seen to influence the decision about feedback given to the student. The t-test results complement the findings from the repeated measures analysis and confirm that this was particularly so with students who expend low effort. The student (James) with LD, who is of a high ability and expends low effort, $t(625) = 15.37, \ p< .001$, and the student (Brian) with LD, who is of a low ability and expends low effort, $t(625) = 7.81, \ p< .001$, received significantly greater positive feedback than their NLD counterparts (Phillip and Jeffrey respectively). Interestingly, among the students who expend high effort, there were only small differences between those with and without LD in regards to feedback (see Appendix 12b). Further, as Figure 4.3.1c shows, the greatest positive feedback was given to those who expend high effort irrespective of their LD status. However, the greatest negative feedback was given to NLD students who expend low effort.
4.3.2 Frustration

Table 4.3.2. Preservice Teachers’ Frustration Felt towards Boys with and without LD

<table>
<thead>
<tr>
<th></th>
<th>LD</th>
<th>NLD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SE</td>
</tr>
<tr>
<td>LD Status</td>
<td>3.426</td>
<td>.037</td>
</tr>
<tr>
<td>Ability</td>
<td>3.505</td>
<td>.036</td>
</tr>
<tr>
<td>Effort</td>
<td>4.487</td>
<td>.043</td>
</tr>
<tr>
<td>LD*Ability</td>
<td>3.468</td>
<td>.042</td>
</tr>
<tr>
<td>LD*Effort</td>
<td>4.140</td>
<td>.047</td>
</tr>
<tr>
<td>LD<em>Ability</em>Effort</td>
<td>4.293</td>
<td>.057</td>
</tr>
<tr>
<td>LD<em>Ability</em>Effort</td>
<td>4.715</td>
<td>.052</td>
</tr>
</tbody>
</table>

A significant main effect for LD status, $F (1, 625) = 26.38, p < .001, \eta^2 = .041$, was found for preservice teacher frustration. As Figure 4.3.2 and Table 4.3.2 show, the $\eta^2$ and mean score difference between frustration felt towards the students with and without LD ($M_1 - M_2 = .150$) shows this. Therefore, greater frustration was felt towards students without LD than students with LD. However, there were no significant main effects for ability, $F (1, 625) = .094, p > .02, \eta^2 = .000$. Thus, there were no differences amongst preservice teachers’ frustrations towards high or low ability level students. Moreover, the greatest significant main effect found for frustration was effort, $F (1, 625) = 2027.15, p < .001, \eta^2 = .765$. This can be seen in the $\eta^2$ and mean scores of frustration felt towards low effort students ($M = 1.410$) and high effort students ($M = 3.066$). Consequently, far greater frustration was felt towards students who expend low effort.
Figure 4.3.2. Preservice Teachers’ Frustrations towards Students

**Figure 4.3.2a**

**Frustration**

<table>
<thead>
<tr>
<th>Effect</th>
<th>$H^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD x Ability x Effort</td>
<td>.081</td>
<td>.000</td>
</tr>
<tr>
<td>LD x Effort</td>
<td>.400</td>
<td>.000</td>
</tr>
<tr>
<td>LD x Ability</td>
<td>.013</td>
<td>.004</td>
</tr>
<tr>
<td>Effort Expended</td>
<td>.765</td>
<td>.000</td>
</tr>
<tr>
<td>Ability Level</td>
<td>.000*</td>
<td>.760*</td>
</tr>
<tr>
<td>LD Status</td>
<td>.041</td>
<td>.000</td>
</tr>
</tbody>
</table>

* = Not Significant
Although ability produced insignificant main effects on its own, preservice teachers did consider a student’s level of ability and his LD status, $F(1, 625) = 8.23, p< .01, \eta^2 = .013$, in regards to feelings of frustration. As can be seen in Figure 4.3.2b, LD status was marginally influential with high ability students. Therefore, preservice teachers felt less frustrated towards students with LD, particularly of high ability than they felt towards NLD students. Moreover, it was the effort expended by the student and his LD status that appeared to most strongly influence frustration level, $F(1, 625) = 416.59, p< .001, \eta^2 = .400$. As can be seen in Figure 4.3.2c, LD status was influential across high and low effort students. However, it was somewhat more influential on low effort students. Consequently, preservice teachers felt a significantly greater difference of frustration between high and low effort NLD students than they did LD students. Interestingly, effort was more influential in teachers’ frustration level for students without LD ($M_1 - M_2 = -2.516$) than students with LD ($M_1 - M_2 = -1.428$). Thus, the frustration felt towards students was governed by the level of effort expended and preservice teachers’ knowledge of a child’s LD status. As a result, preservice teachers felt greater frustration towards students without LD when they expend low effort, and yet less frustration towards students without LD when they expend high effort (see Appendix 12a).

As seen in Figure 4.3.2, preservice teachers’ knowledge of a child’s learning disability can be seen to influence the feeling of frustration towards the student. The t-test results complement the findings from the repeated measures analysis and confirm that this is particularly so in relation to effort expended. Those students with LD who expend low effort (James $t(625) = -18.498, p< .001$; Brian $t(625) = -7.833, p< .001$) evoked far less frustration from preservice teachers than their NLD counterparts. Subsequently, those students with LD who expend high effort (Steven $t(625) = 8.539, p< .001$; Andrew $t(625) = 5.895, p< .001$) evoked greater frustration from preservice teachers than their NLD counterparts (see Appendix 12b). Therefore, as Figure 4.3.2c shows, effort has a greater influence in relation to NLD students than for LD students. Consequently, as Figure 4.3.2c shows, the greatest level of frustration was felt towards NLD students who expend low effort, while the lowest level of frustration was felt towards NLD students who expend high effort. As a result, effort expended is highly influential; students expending high effort elicited far less frustration than their low effort peers ($\eta^2 = .765$).
### 4.3.3 Sympathy

**Table 4.3.3. Preservice Teachers’ Sympathy Felt towards Boys with and without LD**

<table>
<thead>
<tr>
<th></th>
<th>LD</th>
<th>NLD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SE</td>
</tr>
<tr>
<td>LD Status</td>
<td>4.224</td>
<td>.40</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability</td>
<td>4.184</td>
<td>.040</td>
</tr>
<tr>
<td>Effort</td>
<td>3.656</td>
<td>.040</td>
</tr>
<tr>
<td><strong>High</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LD*Ability</td>
<td>4.366</td>
<td>.043</td>
</tr>
<tr>
<td>LD*Effort</td>
<td>4.026</td>
<td>.045</td>
</tr>
<tr>
<td>LD<em>Ability</em>Effort</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A significant main effect for LD status, $F (1, 625) = 369.76, p< .001, \eta^2 = .372$, was found for sympathy. LD status was the greatest significant main effect for sympathy with mean differences in preservice teacher sympathy towards students with and without LD ($M_1 - M_2 = .563$). Thus, Figure 4.3.3 and Table 4.3.3 show that greater sympathy was felt by preservice teachers towards students with LD than their NLD counterparts. A significant main effect for ability, $F (1, 625) = 274.54, p< .001, \eta^2 = .306$, was also found for sympathy. However, the main effect size for ability level was not as high as LD status. This can be seen in the $\eta^2$ and mean differences in preservice teacher sympathy felt towards low ability and high ability students ($M_1 - M_2 = .216$). Therefore, preservice teachers felt greater sympathy for low ability students than their high ability counterparts. A significant main effect for effort, $F (1, 625) = 171.58, p< .001, \eta^2 = .216$, was found for sympathy. However, the main effect size here was lower than ability and LD status. The significance is noticeable with the $\eta^2$ and mean...
score differences between students who expend low effort (M = 3.656) and students who expend high effort (M = 4.230). As a result, preservice teachers felt greater sympathy for students who expend high effort than students who expend low effort.

Figure 4.3.3 Preservice Teachers’ Sympathy towards Students

<table>
<thead>
<tr>
<th>Effect</th>
<th>$n^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD$^3$Ability$^4$Effort</td>
<td>.009</td>
<td>.021</td>
</tr>
<tr>
<td>LD$^3$Effort</td>
<td>.058</td>
<td>.000</td>
</tr>
<tr>
<td>LD$^4$Ability</td>
<td>.071</td>
<td>.000</td>
</tr>
<tr>
<td>Effort Expended</td>
<td>.216</td>
<td>.000</td>
</tr>
<tr>
<td>Ability Level</td>
<td>.306</td>
<td>.000</td>
</tr>
<tr>
<td>LD Status</td>
<td>.372</td>
<td>.000</td>
</tr>
</tbody>
</table>

* = Not Significant
Sympathy was greater towards students with LD, towards low ability students, and towards students who expend high effort. Preservice teachers considered a student’s LD status and amount of effort expended when eliciting sympathy towards them, $F(1, 625) = 38.77, p< .001, \eta^2 = .058$. As shown in Figure 4.3.3c, LD status is particularly influential with students who expend low effort, where sympathy is considerably greater towards students with LD. Moreover, effort is more influential towards NLD students, in regards to preservice teacher sympathy. Furthermore, it was the LD status and ability level of the student that appeared to most strongly influence preservice teachers’ sympathy, $F(1, 625) = 48.05, p< .001, \eta^2 = .071$. As shown in Figure 4.3.3b, LD status is particularly influential towards students who are of a high ability, where sympathy is considerably greater towards students with LD. Moreover, ability is more influential for NLD students in regards to preservice teacher sympathy. Thus preservice teachers generally demonstrated more sympathy (in all cases) to students with LD than their peers without LD when they failed a test (see Appendix 12a).

As seen in Figure 4.3.3, preservice teachers’ knowledge of a child’s LD status can be seen to significantly influence the sympathy preservice teachers felt towards them. The t-test results complement the findings from the repeated measures analysis and confirm that this was particularly so with students who expend low effort, and students of a high ability. The most significant difference is between the two students with and without LD who expend low effort and are of a high ability (James and Phillip respectively), $t(625) = 16.35, p< .001$. This difference is followed by the two students with and without LD, who expend low effort and are of a low ability (Brian and James respectively), $t(625) = 11.43, p< .001$; and those who expend high effort and are of a high ability (Steven and Thomas respectively), $t(625) = 10.38, p< .001$. As Figure 4.3.3 shows, the greatest amount of sympathy was to LD and NLD students who expend high effort and are of a low ability. However, the least amount of sympathy was to NLD students who expend low effort and are of a high ability.
4.3.4 Expectancy of Future Failure

Table 4.3.4. Preservice Teachers’ expectations of Future Failure towards Boys with and without LD

<table>
<thead>
<tr>
<th></th>
<th>LD</th>
<th>NLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD Status</td>
<td>M</td>
<td>SE</td>
</tr>
<tr>
<td>LD</td>
<td>4.311</td>
<td>.029</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ability</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>SE</td>
<td>M</td>
</tr>
<tr>
<td>LD*Ability</td>
<td>4.602</td>
<td>.036</td>
</tr>
<tr>
<td>LD*Effort</td>
<td>4.594</td>
<td>.032</td>
</tr>
</tbody>
</table>

A significant main effect for LD status, F (1, 625) = 265.082, p< .001, \( \eta^2 = .298 \), was found for preservice teachers’ expectations of a student’s future failure. The \( \eta^2 \) and mean score differences between expectations of future failure for students with and without LD (M₁ - M₂ = .430) is noticeable. Consequently, preservice teachers had a significantly higher expectation of future failure for students with LD than their NLD counterparts. A significant main effect for ability, F (1, 625) = 624.9, p< .001, \( \eta^2 = .500 \), was found for preservice teachers’ expectations of a student’s future failure. The differences in \( \eta^2 \) and mean scores between the expectations of future failure for high ability and low ability students (M₁ - M₂ = .730) shows this. Thus, preservice teachers had a considerably greater expectation of future failure for students of a low ability than their high ability counterparts. A significant main effect for effort, F (1, 625) = 750.287, p< .001, \( \eta^2 = .546 \), was found for preservice teachers’ expectations of a student’s future failure. The level of effort expended was the most highly significant main effect found for expectation of future failure (marginally ahead of ability). This
can be seen in the $\eta^2$ and mean expectation scores given to students who expend low effort ($M = 4.554$) and students who expend high effort ($M = 3.638$). Thus, preservice teachers held higher expectations of future failure for students who expend low effort than their high effort counterparts (as shown in Table 4.3.4 and Figure 4.3.4).

Figure 4.3.4 Preservice Teachers’ Expectations of Future Failure of Students

<table>
<thead>
<tr>
<th>Effect</th>
<th>$n^2$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD $\times$ Ability $\times$ Effort</td>
<td>.003*</td>
<td>.210*</td>
</tr>
<tr>
<td>LD $\times$ Effort</td>
<td>.227</td>
<td>.000</td>
</tr>
<tr>
<td>LD $\times$ Ability</td>
<td>.050</td>
<td>.000</td>
</tr>
<tr>
<td>Effort Expended</td>
<td>.546</td>
<td>.000</td>
</tr>
<tr>
<td>Ability Level</td>
<td>.500</td>
<td>.000</td>
</tr>
<tr>
<td>LD Status</td>
<td>.298</td>
<td>.000</td>
</tr>
</tbody>
</table>

* = Not Significant
Preservice teachers considered a student’s LD status and ability level when eliciting their expectation of future failure for the student, $F(1, 625) = 32.903, p< .001, \eta^2 = .050$. As shown in Figure 4.3.4b, LD status was particularly influential for students of a high ability, where expectation of future failure was considerably higher for students with LD. Moreover, ability level was more influential in eliciting preservice teachers’ expectations towards NLD students than for LD students. Furthermore, it was the LD students’ status and effort expended that appeared to most strongly influence preservice teachers’ expectations, $F(1, 625) = 183.644, p< .001, \eta^2 = .227$. As shown in Figure 4.3.4c, LD status was particularly influential with students who expend high effort, where expectation of future failure was considerably higher for students with LD. Moreover effort expended was more influential in eliciting their expectation towards NLD students than LD students. The highest expectation of future failure was elicited for LD and NLD students who were of a low ability and expended low effort. However, the lowest expectation of future failure was elicited for NLD students who were of a high ability and expended high effort. Thus, as a student’s level of ability and amount of effort expended increased, the influence that LD status conveyed in regards to expectations of future failure, was greater. However, when effort expended was high, LD status still created a greater difference in expectations of future failure for students with and without LD (see Appendix 12a).

As seen in Figure 4.3.4, preservice teachers’ knowledge of a child’s LD status can be seen to significantly influence the expectation they have of the child’s future failure. The t-test results strengthen the findings from the repeated measures analysis and confirm that this was particularly so with students who expend high effort, and to some extent, those of a high ability. The most significant difference is between the two students with and without LD who expend high effort and are of a high ability (Steven and Thomas respectively), $t(625) = 17.278, p< .001$. This difference is followed by the two students with and without LD who expend high effort and are of a low ability (Christopher and Andrew respectively); and those who expend low effort and are of a high ability (James and Phillip respectively), $t(625) = 3.698, p< .001$. As Figure 4.3.4 shows, the highest expectation of future failure was for LD and NLD students who expend low effort and are of a low ability. However, the lowest expectation of future failure was for NLD students who expend high effort and are of a high ability.
4.3.5 Brief Summary of Attributional Vignette Responses

Figures 4.3.5 (a-d) present the differences in each attributional response mean scores between those with and those without LD. These differences relate to the amount of effort expended and the level of ability. Thus, the figures give a summary snapshot of the influence of LD status on varying efforts and ability. The results show that preservice teachers’ knowledge about LD status does have an effect upon their attributional responses. In regards to feedback and emotional responses (frustration and sympathy), LD status has particularly shown a greater influence on preservice teachers’ responses towards students who expend low effort, and towards students of a high ability. For example, as Figure 4.3.5a shows, the influence of LD status is greater on students who expend low effort (.669) than those who expend high effort (.023). Moreover, the influence of LD status is greater on students who are of a high ability (.509) than those who are of a low ability (.138). Thus, preservice teachers were more positive to students with LD, who expend low effort, and/or are of a high ability.

As Figures 4.3.5a-c show, the less effort students expend, the greater significance LD status had on the feedback that preservice teachers gave, and the frustration and sympathy that they felt towards students. Moreover, the figures also show that the higher the students’ ability the greater significance LD status had on the feedback that preservice teachers gave, and the frustration and sympathy that they felt towards students. Thus, regarding feedback, frustration, and sympathy, there were minimal differences between preservice teachers’ responses to students with and without LD who expend high effort and are of a low ability. Furthermore the most significant differences between their feedback and emotional responses were towards students with and without LD who expend low effort and are of a high ability.
Figure 4.3.5 LD Status Influence on Attributional Responses

Figure 4.3.5a LD Status Influence on Feedback

Figure 4.3.5b LD Status Influence on Frustration

Figure 4.3.5c LD Status Influence on Sympathy

Figure 4.3.5d LD Status Influence on Expectation of Future Failure
In regards to preservice teachers’ expectations of future failure, LD status is more influential on their expectations of students who expend high effort and are of a high ability. As Figure 4.3.5d shows, the greater effort students expend, the greater significance LD status had on the expectations preservice teachers held towards future failure. Furthermore, the figure shows that the higher the student’s ability, the greater significance LD status has on preservice teachers’ expectations towards future failure. Thus, regarding the expectation of future failure, there were minimal differences between preservice teachers’ expectations of students with and without LD who expend low effort and are of a low ability. Moreover, the most significant differences between their expectations were towards students with and without LD who expend high effort and are of a high ability.

As well as considering preservice teachers’ understandings about students with LD through attributional responses, another important aspect that needs to be considered is preservice teachers’ attitudes towards students with LD, and differentiating the curriculum for diverse learners.

4.4 ATTITUDES

Multivariate analyses of variance (MANOVAs) were carried out to examine preservice teachers’ attitudinal variables towards those with LD and differentiating the curriculum. The MANOVAs aimed to investigate whether gender, completion of the compulsory inclusive education subject, or experience with students with LD affected the MANOVA scores. The significant findings from the MANOVAs for preservice teachers’ attitudes are presented in Table 4.4.

The following sections report the results of the MANOVA analyses for attitude towards students with LD and differentiating the curriculum which considers the three independent measures (gender, completion of inclusive education, LD experience). Each sub-section firstly reports the results to the MANOVA analysis from the subscale variable for attitude towards LD, and differentiating the curriculum. They then
follow on by reporting any significant differences regarding the specific individual statements.

Table 4.4. Significant Comparisons of Attitudes towards Students with LD and Differentiating the Curriculum

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Group</th>
<th>Analysis</th>
<th>Variables</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Scale Variables</td>
<td>Multivariate Test Between Subjects</td>
<td>LD Att</td>
<td>.000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.024</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diff Att</td>
<td>.005&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.013</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.000&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.020</td>
</tr>
<tr>
<td>Male:</td>
<td>LD Attitude</td>
<td>Multivariate Test Between Subjects</td>
<td>LD Att 1</td>
<td>.002&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.030</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD Att 9</td>
<td>.000&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.022</td>
</tr>
<tr>
<td>Female:</td>
<td>Diff Attitude</td>
<td>Multivariate Test Between Subjects</td>
<td>Diff Att 10</td>
<td>.008&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.027</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diff Att 11</td>
<td>.002&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.015</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.001&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.016</td>
</tr>
<tr>
<td>Inclusive Ed.</td>
<td>Scale Variables</td>
<td>Multivariate Test Between Subjects</td>
<td>LD Att</td>
<td>.000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.071</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diff Att</td>
<td>.000&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.028</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.000&lt;sup&gt;b&lt;/sup&gt;</td>
<td>.065</td>
</tr>
<tr>
<td>Completed:</td>
<td>LD Attitude</td>
<td>Multivariate Test Between Subjects</td>
<td>LD Att 1</td>
<td>.000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.058</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD Att 9</td>
<td>.000&lt;sup&gt;c&lt;/sup&gt;</td>
<td>.029</td>
</tr>
<tr>
<td>Not Completed:</td>
<td>Diff Attitude</td>
<td>Multivariate Test Between Subjects</td>
<td>Diff Att 8</td>
<td>.000&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.066</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diff Att 10</td>
<td>.000&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.023</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diff Att 11</td>
<td>.000&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.028</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diff Att 12</td>
<td>.000&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.028</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diff Att 14</td>
<td>.000&lt;sup&gt;d&lt;/sup&gt;</td>
<td>.025</td>
</tr>
<tr>
<td>LD Exp.</td>
<td>Scale Variables</td>
<td>Multivariate Test Between Subject</td>
<td>LD Att</td>
<td>.034&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.008</td>
</tr>
<tr>
<td>None:</td>
<td></td>
<td></td>
<td>Diff Att</td>
<td>.036</td>
<td>.011</td>
</tr>
<tr>
<td>Lots:</td>
<td></td>
<td></td>
<td></td>
<td>.037</td>
<td>.011</td>
</tr>
<tr>
<td>N = 141&lt;sup&gt;+&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N = 488&lt;sup&gt;+&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N = 262&lt;sup&gt;+&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N = 364&lt;sup&gt;+&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a = Significant at the .05 level
*b = Significant at the .025 level
*c = Significant at the .01 level
*d = Significant at the .008 level
+ = Number of respondents from the sub-scale variable MANOVAs.
As can be seen in Table 4.4, significant differences were found between male and female preservice teachers in regards to their attitudes towards students with LD, $F(1, 629) = 8.114$, $p < .001$, $\eta^2 = .013$. Female preservice teachers had an overall higher positive attitude ($M = 3.44$) towards students with LD than did male preservice teachers ($M = 3.26$). More specifically, the MANOVA test on the individual LD attitude statements shows that statements 1 ($F(1, 637) = 14.498$, $p < .001$, $\eta^2 = .022$) and 9 ($F(1, 637) = 11.028$, $p < .01$, $\eta^2 = .017$) resulted in significant differences between male and female preservice teachers. Both statements refer to students with LD usually being low achievers, and not doing well in most subjects (statements 1 and 9 respectively). Females had an overall higher positive belief than males in that students with LD are not usually low achievers ($M_1 - M_2 = .40$) and can do well in most subjects ($M_1 - M_2 = .28$).

Significant differences were also found between male and female preservice teachers in regards to their attitudes towards differentiating the curriculum, $F(1, 629) = 12.942$, $p < .001$, $\eta^2 = .020$. Female preservice teachers had an overall higher positive attitude ($M = 3.61$) towards differentiating the curriculum than male preservice teachers ($M = 3.39$). More specifically, the MANOVA test on the individual differentiation attitude statements shows that statements 10 ($F(1, 635) = 9.389$, $p < .01$, $\eta^2 = .015$) and 11 ($F(1, 635) = 10.180$, $p < .01$, $\eta^2 = .016$) resulted in significant differences between male and female preservice teachers. These statements refer to beliefs that students working on different assignments lead to unfair grading, and that students who differ markedly in ability level should be taught in special classes (statements 10 and 11 respectively). Females, compared to males, had an overall higher positive belief that varying the assignments is fair ($M_1 - M_2 = .26$), and that students of all abilities are best taught in an inclusive classroom ($M_1 - M_2 = .34$). Thus, significant differences exist between genders, and females generally have a more positive attitude than their male counterparts. Although these differences are significant, it needs to be noted that these differences are minimal (see Appendix 13).

Completion of the compulsory inclusive education subject resulted in mediating significances in preservice teachers’ attitudes towards students with LD and differentiating the curriculum. As Table 4.4 shows, there were significant differences between preservice teachers who had and had not completed the compulsory inclusive
education subject concerning their attitudes towards students with LD, F (1, 626) = 17.983, p< .001, \( \eta^2 = .028 \). Preservice teachers who had completed the compulsory inclusive education subject had an overall higher positive attitude (M = 3.53) towards students with LD than their non-completed counterparts (M = 3.30). More specifically, the MANOVA test on the individual LD attitude statements shows that statements 1 (F (1, 634) = 18.757, p< .001, \( \eta^2 = .029 \)) and 9 (F (1, 634) = 27.607, p< .001, \( \eta^2 = .042 \)) resulted in significant differences between preservice teachers who had and had not completed the compulsory subject. Both statements refer to students with LD usually being low achievers, and not doing well in most subjects (statements 1 and 9 respectively). Preservice teachers who had completed the compulsory subject had an overall higher positive belief, than those who had not completed the subject, that students with LD are not usually low achievers (M₁ – M₂ = .39) and can do well in most subjects (M₁ – M₂ = .37).

Significant differences were also found between those who had and had not completed the compulsory subject in relation to their attitudes towards differentiating the curriculum, F (1, 626) = 43.507, p< .001, \( \eta^2 = .065 \). Preservice teachers who had completed the compulsory inclusive education subject had an overall higher positive attitude (M = 3.75) towards differentiating the curriculum than preservice teachers who had not completed the subject (M = 3.42). Moreover, the MANOVA test on the individual differentiation attitude statements shows that all of the statements, with the exception of statement 6, resulted in significant differences between preservice teachers who had and had not completed the compulsory inclusive education subject. These significant statements refer to differentiating assignments and assessment tasks for students in an inclusive classroom. Preservice teachers who had completed the compulsory subject had an overall higher positive belief that assignments and assessment tasks should be differentiated towards all students in an inclusive classroom than their counterparts who had not yet completed the subject. Although it is pleasing to see significant influences through completion of the compulsory subject, where preservice teachers’ attitudes improve, the compulsory subject tends to only minimally have an impact (see Appendix 14).

As can be seen in Table 4.4, the results show that there were no significant differences between preservice teachers and experience with LD students. Thus preservice
teachers who had experience of students with LD and those who had no previous
experience did not significantly differ in regards to their attitudes towards students
with LD or differentiating the curriculum (see Appendix 15).

4.4.1 Influence of Inclusive Education on Attitudes

Table 4.4.1. Influence of Inclusive Education Completion on Attitudes towards
Students with LD and Differentiation

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Group</th>
<th>Analysis</th>
<th>Variables</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Scale Variables</td>
<td>Multivariate Test</td>
<td>LD Att</td>
<td>.002*</td>
<td>.086</td>
</tr>
<tr>
<td></td>
<td>Completed:</td>
<td>Between Subjects</td>
<td>Diff Att</td>
<td>.102</td>
<td>.019</td>
</tr>
<tr>
<td></td>
<td>N = 38+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diff Attitude</td>
<td>Multivariate Test</td>
<td>Diff Att 6</td>
<td>.022*</td>
<td>.103</td>
</tr>
<tr>
<td></td>
<td>Not Completed:</td>
<td>Between Subjects</td>
<td>Diff Att 8</td>
<td>.007*</td>
<td>.051</td>
</tr>
<tr>
<td></td>
<td>N = 103+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD Att</td>
<td>.000b</td>
<td>.051</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diff Att</td>
<td>.000b</td>
<td>.051</td>
</tr>
<tr>
<td>Female</td>
<td>Scale Variables</td>
<td>Multivariate Test</td>
<td>LD Att</td>
<td>.000</td>
<td>.056</td>
</tr>
<tr>
<td></td>
<td>Completed:</td>
<td>Between Subjects</td>
<td>Diff Att</td>
<td>.001</td>
<td>.024</td>
</tr>
<tr>
<td></td>
<td>N = 224+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LD Attitude</td>
<td>Multivariate Test</td>
<td>LD Att 1</td>
<td>.000c</td>
<td>.060</td>
</tr>
<tr>
<td></td>
<td>Not Completed:</td>
<td>Between Subjects</td>
<td>LD Att 9</td>
<td>.000c</td>
<td>.036</td>
</tr>
<tr>
<td></td>
<td>N = 260+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diff Attitude</td>
<td>Multivariate Test</td>
<td>Diff Att 10</td>
<td>.000*</td>
<td>.055</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Between Subjects</td>
<td>Diff Att 11</td>
<td>.002d</td>
<td>.020</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diff Att 12</td>
<td>.000d</td>
<td>.031</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Diff Att 14</td>
<td>.000d</td>
<td>.025</td>
</tr>
</tbody>
</table>

*a = Significant at the .05 level
*b = Significant at the .025 level
*c = Significant at the .01 level
*d = Significant at the .008 level
+ = Number of respondents from the sub-scale variable MANOVAs.

The compulsory inclusive education subject, carried out at tertiary institutions, does
have a significant influence upon preservice teachers’ attitudes towards students with
LD, and differentiation of the curriculum. As can be seen in Table 4.4.1, the
compulsory inclusive education subject does not significantly impact upon male
preservice teachers’ attitudes towards students with LD, $F(1, 141) = 2.708, p > .025, \eta^2 = .019$. However, the compulsory subject does make a significant difference for female preservice teachers in their attitude towards students with LD, $F(1, 484) = 12.085, p < .01, \eta^2 = .024$. Female preservice teachers who had completed the compulsory subject held higher positive attitudes towards students with LD than their counterparts who had not completed the subject ($M_1 - M_2 = .21$). More specifically, the MANOVA test on the individual LD attitude statements shows that statements 1 ($F(1, 491) = 18.321, p < .001, \eta^2 = .036$) and 9 ($F(1, 491) = 18.890, p < .001, \eta^2 = .037$) resulted in significant differences between those who had and had not completed the compulsory subject. Both statements refer to students with LD usually being low achievers and not doing well in most subjects (statements 1 and 9 respectively). Females who had completed the compulsory subject held an overall higher positive belief, than females who had not completed the subject, that students with LD are not usually low achievers ($M_1 - M_2 = .42$) and can do well in most subjects ($M_1 - M_2 = .34$).

The compulsory inclusive education subject does significantly impact upon both male, $F(1, 141) = 12.827, p < .001, \eta^2 = .084$, and female, $F(1, 484) = 25.813, p < .001, \eta^2 = .051$, preservice teachers’ attitudes towards differentiating the curriculum. Male preservice teachers who had completed the compulsory subject held higher positive attitudes towards differentiating the curriculum than their male counterparts who had not completed the subject ($M_1 - M_2 = .41$). More specifically, the MANOVA test on the individual differentiation attitude statements shows that statements 6 ($F(1, 141) = 7.429, p < .01, \eta^2 = .051$) and 8 ($F(1, 141) = 7.839, p < .01, \eta^2 = .053$) resulted in significant differences between male preservice teachers who had and had not completed the compulsory subject. Both statements refer to the curriculum and that it is appropriate to present the curriculum the same way to all students, and for all students to carry out workbook exercises which are integral to the curriculum (statements 6 and 8 respectively). Male preservice teachers who had completed the compulsory subject had a higher belief, than their counterparts who had not yet completed the subject that the curriculum needs to be presented in varied ways ($M_1 - M_2 = .50$) and that workbook exercises are not an integral part of the curriculum for all students ($M_1 - M_2 = .60$). Female preservice teachers who had completed the compulsory subject held higher positive attitudes towards differentiating the
curriculum than their counterparts who had not completed the subject ($M_1 - M_2 = .28$). More specifically, the MANOVA test on the individual differentiation attitude statements shows that, with the exception of statements 6 and 8, all resulted in significant differences between female preservice teachers who had and had not completed the compulsory inclusive education subject. These significant statements refer to differentiating assignments and assessment tasks for students in an inclusive classroom (not specific to the curriculum). Female preservice teachers who had completed the compulsory subject had an overall higher positive belief that assignments and assessment tasks should be differentiated for all students in an inclusive classroom than their counterparts who had not yet completed the subject.

Thus, the tertiary institutions’ compulsory inclusive education subject for preservice teachers had significant impacts upon male and female preservice teachers regarding their attitude towards differentiating the curriculum. However, the results show that the effect of the compulsory subject on preservice teachers’ attitudes towards students with LD, does not have any significant impact upon male preservice teachers. The compulsory subject only significantly influenced female preservice teachers (see Appendix 16).

### 4.5 TEACHER EFFICACY

Multivariate analyses of variance were carried out to examine preservice teachers’ general and personal teacher efficacy. The MANOVAs aimed to investigate whether gender, completion of the compulsory inclusive education, or experience with those with LD affected the MANOVA scores. The significant findings from the MANOVAs for preservice teachers’ teacher efficacy are presented in Table 4.5.

The following sections report the results of the MANOVA analyses for general and personal teacher efficacy which considers the three independent measures (gender, completion of inclusive education, LD experience). Each sub-section firstly reports the results to the MANOVA analysis from the sub-scale variable for general, and personal teacher efficacy. This is followed by any significant differences regarding the specific individual statements.
As can be seen in Table 4.5, significant differences were found between male and female preservice teachers regarding their general teacher efficacy, $F (1, 607) = 14.280, p < .001, \eta^2 = .023$. Female preservice teachers had an overall higher level of general teacher efficacy ($M = 3.82$) than male preservice teachers ($M = 3.54$). Specific differences occurred between males and females in relation to general teacher efficacy statements concerning students’ motivational behaviour (statements 2, 10) and parental influence (statement 5). Male preservice teachers had a lower general teacher efficacy level than female preservice teachers with regard to students’ motivation ($M_1 - M_2 = .41, F (1, 631) = 15.566, p < .001, \eta^2 = .024$), behaviour ($M_1 - M_2 = .33, F (1,
631) = 7.228, p< .01, η² = .011), and parental influence (M₁ – M₂ = .30, F (1, 631) = 7.148, p< .01, η² = .011). Thus, female preservice teachers felt that teachers had a greater impact upon students’ motivation and behaviour in the classroom than did their male counterparts. Interestingly, although not all of the differences of each of the individual statements were significant, females had a higher general teacher efficacious level in all of the statements than males. Although these differences are significant, it needs to be noted that these differences are minimal (see Appendix 17).

Significant differences were also found between male and female preservice teachers and their personal teacher efficacy, F (1, 607) = 8.114, p< .01, η² = .013. Female preservice teachers, again, had an overall higher level of personal teacher efficacy (M = 4.28) than did male preservice teachers (M = 4.10). More specifically, even though the sub-scale variable of personal teacher efficacy was significant, none of the individual personal teacher efficacy statements resulted in significant differences between male and female preservice teachers (see Appendix 17).

Completion of the compulsory inclusive education subject resulted in a mediation of significances towards preservice teachers’ efficacious levels. As Table 4.5 shows, there were significant differences between preservice teachers who had and had not completed the compulsory inclusive education subject in regards to their general teacher efficacy, F (1, 605) = 7.752, p< .01, η² = .013. Preservice teachers who had completed the compulsory inclusive education subject had an overall higher level of general teacher efficacy (M = 3.86) than their non-completed counterparts (M = 3.68). More specifically, even though the sub-scale variable of general teacher efficacy was significant, none of the individual general teacher efficacy statements resulted in significant differences between preservice teachers who had completed the compulsory subject and their counterparts who had not (see Appendix 18).

Significant differences were also found between those who had and had not completed the compulsory subject and their personal teacher efficacy, F (1, 605) = 14.143, p< .001, η² = .023. Preservice teachers who had completed the compulsory inclusive education subject had an overall higher personal teacher efficacy (M = 4.35) than their non-completed counterparts (M = 4.15). Moreover, the MANOVA test on the individual personal teacher efficacy statements shows that statements 3 (F (1, 613)
9.442, p< .01, η² = .015), and 9 (F (1, 613) = 8.371, p< .01, η² = .014), resulted in significant differences between those who had and had not completed the compulsory subject. Both statements refer to preservice teachers believing that when they try they can get through to the most difficult, and unmotivated students (statements 3 and 9 respectively). Preservice teachers who had completed the compulsory subject had a higher efficacy belief overall than preservice teachers who had not completed the subject in that they believed they could get through to the most difficult (M₁ – M₂ = .24) and unmotivated (M₁ – M₂ = .23) students (see Appendix 18).

The results show that there were no significant differences between preservice teachers and experience with LD students. Thus preservice teachers who had previous experience with students with LD and those who had no previous experience did not significantly differ in relation to their general teacher efficacy or personal teacher efficacy (see Appendix 19).

### 4.5.1 Influence of Inclusive Education on Teacher Efficacy

The compulsory inclusive education subject carried out at tertiary institutions, only has limited significance on preservice teachers’ teacher efficacy. As can be seen in Table 4.5.1, the compulsory inclusive education subject does not have any significant impact upon male preservice teachers’ general teacher efficacy, F (1, 136) = 4.701, p> .025, η² = .034, or female preservice teachers’ general teacher efficacy, F (1, 268) = 1.904, p> .025, η² = .004. Nor does the compulsory inclusive education subject have any significant impact upon male preservice teachers’ personal teacher efficacy, F (1, 136) = 3.100, p> .025, η² = .023. However, the compulsory subject does make a significant difference to female preservice teachers’ personal teacher efficacy, F (1, 268) = 8.295, p< .01, η² = .017. Nevertheless, this significance was small, and none of the individual personal teacher efficacy statements resulted in any significant differences (see Appendix 20).
Table 4.5.1. *Influence that Inclusive Education Completion has on General and Personal Teacher Efficacy*

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Group</th>
<th>Analysis</th>
<th>Variables</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Completed: N = 37*</td>
<td>Scale Variables</td>
<td>Multivariate Test</td>
<td>Between Subjects</td>
<td>GTE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not Completed: N = 99+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>Completed: N = 219*</td>
<td>Scale Variables</td>
<td>Multivariate Test</td>
<td>Between Subjects</td>
<td>GTE</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Not Completed: N = 249+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a = Significant at the .05 level
*b = Significant at the .025 level
+ = Number of respondents from the sub-scale variable MANOVAs.

The compulsory inclusive education subject therefore has no significant impact upon male or female preservice teachers’ general teacher efficacy, and only minimally has an influence on female preservice teachers’ personal teacher efficacy.

### 4.6 INSTRUCTIONAL STRATEGIES

This section of results will firstly report on preservice teachers’ proposed frequency of use of instructional strategies, and higher cognitive level instructional strategies for students with and without LD. The survey instrument included 20 various instructional strategies and asked respondents to report on their proposed frequency of use of each strategy for students with and students without LD. Thus, preservice teachers were asked to rate each of the 20 instructional strategies twice (for LD and NLD students) in regards to frequency of use. Through this study’s previously discussed factor analysis, two sub-scale variables were created that included 5 of the original instructional strategies which the investigator termed higher cognitive level instructional strategies. The two sub-scale variables consisted of the five strategies for students with LD and the same five strategies for students without LD. Thus, this section reports on the sub-scale variables’ MANOVA test results and then follows with the MANOVA carried out with all twenty instructional strategies. The second
part of this section also reports on the findings from the t-tests comparing the frequency of instructional strategies for students with LD in comparison to students without LD.

Multivariate analyses of variance were carried out to examine preservice teachers’ proposed frequency of use of instructional strategies, and also their proposed use of specific higher cognitive level instructional strategies (subscale variables). The MANOVAs aimed to investigate whether gender, completion of the compulsory inclusive education subject, or experience with those with LD affected the MANOVA scores. The significant findings from the MANOVAs for preservice teachers’ proposed use of instructional strategies, and higher cognitive level instructional strategies (subscale variables) are presented in Table 4.6.

As can be seen in Table 4.6, significant differences between male and female preservice teachers, about their proposed frequency of use of the higher cognitive level instructional strategies, were only found for NLD students, $F(1, 526) = 7.754$, $p < .01$, $\eta^2 = .015$. Female preservice teachers showed that they would use the higher cognitive level instructional strategies ($M = 4.02$) more frequently with NLD students than their male counterparts ($M = 3.83$). Moreover, the results from the MANOVA test on the individual instructional strategies for NLD students shows that modelling ($F(1, 392) = 11.478$, $p < .0025$, $\eta^2 = .029$), peer tutoring ($F(1, 392) = 9.840$, $p < .0025$, $\eta^2 = .025$), and learning contracts ($F(1, 392) = 13.410$, $p < .001$, $\eta^2 = .033$) resulted in significant differences between male and female preservice teachers. Females would use these instructional strategies more frequently than would their male counterparts (see Appendix 21).
Table 4.6. Significant Comparisons of Proposed Frequency of use of Instructional Strategies

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Group</th>
<th>Analysis</th>
<th>Variables</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Scale Variables (Higher Cognitive Level Instructional Strategies)</td>
<td>Multivariate Test Between Subjects</td>
<td>NLD Instr.</td>
<td>.008**a</td>
<td>.006*b .018 .015</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td></td>
<td>LD Instr.</td>
<td>.188</td>
<td>.003</td>
</tr>
<tr>
<td>Male:</td>
<td>N = 107+</td>
<td>NLD Instruct</td>
<td>Multivariate Test Between Subjects</td>
<td>NLD (Modelling)</td>
<td>.000**a</td>
</tr>
<tr>
<td>Female:</td>
<td>N = 419+</td>
<td>NLD Instruct</td>
<td>NLD (Peer Tutoring)</td>
<td>.002**e</td>
<td>.005  .025</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NLD (Learning Contract)</td>
<td>.000**e</td>
<td>.007  .033</td>
</tr>
<tr>
<td>Inclusive Ed.</td>
<td>Scale Variables</td>
<td>Multivariate Test</td>
<td></td>
<td>.175</td>
<td>.007</td>
</tr>
<tr>
<td>Completed:</td>
<td>NLD Instruct</td>
<td>Multivariate Test</td>
<td>NLD (Learning Centre)</td>
<td>.000**a</td>
<td>.000  .138</td>
</tr>
<tr>
<td></td>
<td>N = 229+</td>
<td>NLD Instruct</td>
<td>NLD (Modelling)</td>
<td>.000**e</td>
<td>.000  .040</td>
</tr>
<tr>
<td>Not Completed:</td>
<td>N = 295+</td>
<td>NLD Instruct</td>
<td>NLD (Peer Tutoring)</td>
<td>.000**e</td>
<td>.000  .048</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NLD (Tiered Assignments)</td>
<td>.002**e</td>
<td>.000  .026</td>
</tr>
<tr>
<td></td>
<td>LD Instruct</td>
<td>Multivariate Test</td>
<td>LD (modelling)</td>
<td>.036**a</td>
<td>.001  .085</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>LD (Peer Tutoring)</td>
<td>.001**e</td>
<td>.000  .028</td>
</tr>
<tr>
<td>LD Exp.</td>
<td>Scale Variables</td>
<td>Multivariate Test</td>
<td></td>
<td>.170</td>
<td>.006</td>
</tr>
<tr>
<td>None: N = 129+</td>
<td>NLD Instruct</td>
<td>Multivariate Test</td>
<td></td>
<td>.414</td>
<td>.053</td>
</tr>
<tr>
<td>Lots: N = 40+</td>
<td>NLD Instruct</td>
<td>Multivariate Test</td>
<td></td>
<td>.164</td>
<td>.064</td>
</tr>
</tbody>
</table>

*a = Significant at the .05 level  
*b = Significant at the .025 level  
*e = Significant at the .002 level  
+ = Number of respondents from the sub-scale variable MANOVAs.

Completion of the compulsory inclusive education subject resulted in no significant differences for the frequency of higher cognitive level instructional strategies used for students with and without LD. Furthermore, the results from the MANOVA test on
the individual instructional strategies for NLD students shows that modelling (F (1, 390) = 16.506, p< .001, η² = .041), peer tutoring (F (1, 392) = 19.654, p< .001, η² = .048), learning centres (F (1, 392) = 15.991, p< .001, η² = .040), and tiered assignments (F (1, 392) = 10.222, p< .0025, η² = .026) resulted in significant differences between preservice teachers who had and had not completed the compulsory subject. Preservice teachers who had completed the compulsory subject would use these instructional strategies more frequently than would those who had not completed the subject (see Appendix 22). The results for preservice teachers’ proposed frequency of use of instructional strategies for LD students show that modelling (F (1, 380) = 10.972, p< .0025, η² = .028), and peer tutoring (F (1, 380) = 11.747, p< .0025, η² = .030) resulted in significant differences. Preservice teachers who had completed the compulsory subject would use these instructional strategies more frequently than would those who had not completed the subject (see Appendix 22).

The results show that there were no significant differences between preservice teachers who had some or no experience with LD students. Thus preservice teachers who had previous experience with students with LD and those who had no previous experience did not significantly differ concerning their intended frequency of use of instructional strategies for students with and without LD (see Appendix 23).

### 4.6.1 Influence of Inclusive Education on Instructional Strategies

As Table 4.6.1 shows, the compulsory inclusive education subject did not have any influence upon male preservice teachers’ intended use of instructional strategies or higher cognitive level instructional strategies for students with or without LD (see Appendix 24). The compulsory subject only partly significantly influenced female preservice teachers’ proposed use of instructional strategies for NLD students. The results show that modelling (F (1, 307) = 9.839, p< .001, η² = .031), peer tutoring (F (1, 307) = 16.785, p< .001, η² = .052), and learning centres (F (1, 307) = 13.443, p< .001, η² = .042) resulted in significant differences between female preservice teachers.
who had and had not completed the compulsory subject. Female preservice teachers who had completed the compulsory subject would use these instructional strategies more frequently than would female preservice teachers who had not completed the subject (see Appendix 24).

Table 4.6.1. Influence that Inclusive Education Completion has on Proposed Frequency of use of Instructional Strategies

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Group</th>
<th>Analysis</th>
<th>Variables</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Scale Variables</td>
<td>Multivariate Test</td>
<td>NLD Instruct</td>
<td>.224</td>
<td>.028</td>
</tr>
<tr>
<td>Completed:</td>
<td>N = 33*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Completed:</td>
<td>LD Instruct</td>
<td>Multivariate Test</td>
<td>NLD (Learning Centres)</td>
<td>.001**</td>
<td>.141</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NLD (Modelling)</td>
<td>.000*</td>
<td>.042</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NLD (Peer Tutoring)</td>
<td>.000*</td>
<td>.031</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>Scale Variables</td>
<td>Multivariate Test</td>
<td>.426</td>
<td>.004</td>
</tr>
<tr>
<td>Completed:</td>
<td>N = 196*</td>
<td>NLD Instruct</td>
<td>Multivariate Test</td>
<td>Between Subjects</td>
<td>NLD (Learning Centres)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NLD (Modelling)</td>
<td>.000*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NLD (Peer Tutoring)</td>
<td>.000*</td>
</tr>
<tr>
<td>Not Completed:</td>
<td>LD Instruct</td>
<td>Multivariate Test</td>
<td>.082</td>
<td>.097</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a = Significant at the .05 level  
*e = Significant at the .002 level  
+ = Number of respondents from the sub-scale variable MANOVAs.

Thus, the tertiary institutions’ compulsory inclusive education subject for preservice teachers had no impact upon male teachers in relation to their intended frequency of use of instructional strategies for students with and without LD. The subject also had no significant impact upon preservice teachers’ proposed frequency of use of instructional strategies for students with LD. The only significant impact that resulted was for female preservice teachers’ intended frequency of use of strategies for students without LD, which was minimal.
4.6.2 Instructional Strategies for Students with LD in Comparison to Students without LD

Means and standard deviations for instructional strategies that preservice teachers intend to use for students with and students without LD are presented in the following tables. A paired sample t-test was carried out to examine if there were any significant differences between the higher cognitive level instructional strategies (subscale) and individual instructional strategies used for students with and without LD.

4.6.2.1 Differences Amongst the Higher Cognitive Level Instructional Strategies

A paired sample t-test was carried out to examine if there were any significant differences between the higher cognitive level instructional strategies variables, which were created from the factor analysis discussed earlier (‘NLD Instruct’ and ‘LD Instruct’). As Table 4.6.2.1 shows, there was a significant difference between the higher cognitive level strategies used for students without LD compared to students with LD. This group of strategies was reported to be used far more frequently for students without LD than students with LD (M₁ - M₂ = .92, F = 23.70, p< .001). Although this group of strategies is just as important for students with LD as it is for students without LD (Bender, 2002; Butler, 1995; Reid & Lienemann, 2006; Swanson, 2001; Ysseldyke & Algozzine, 2006), these strategies were not reported as frequently by preservice teachers for students with LD.

Table 4.6.2.1. Comparison of Frequency Rates for Proposed Use of Higher Cognitive Level Instructional Strategies For Students with and without LD

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>T</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>NLD Instructions</td>
<td>3.98</td>
<td>.62</td>
<td>23.70</td>
<td>.000*</td>
</tr>
<tr>
<td>LD Instructions</td>
<td>3.06</td>
<td>.66</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* = Significant at the .05 level
4.6.2.2 Individual Instructional Strategies used with the Greatest of Differences

Of the original twenty instructional strategies, there were significant differences for sixteen strategies that preservice teachers would use for students with and without LD (see Appendix 25). Interestingly the most significant differences were the higher cognitive level instructional strategies (that formed, through factor analysis, the variable ‘higher cognitive level instructional strategies’). All of these strategies were reported as likely to be used far more frequently for students without LD than students with LD.

Table 4.6.2.2. Strategies with the Greatest of Differences of Usage between Students with and without LD

<table>
<thead>
<tr>
<th></th>
<th>NLD</th>
<th>SD</th>
<th>LD</th>
<th>SD</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent Study</td>
<td>3.84</td>
<td>.87</td>
<td>2.69</td>
<td>.89</td>
<td>22.51</td>
<td>.000*</td>
</tr>
<tr>
<td>Higher-Level Thinking</td>
<td>4.03</td>
<td>.83</td>
<td>3.05</td>
<td>.97</td>
<td>19.59</td>
<td>.000*</td>
</tr>
<tr>
<td>Student Led Discussion</td>
<td>3.98</td>
<td>.87</td>
<td>3.14</td>
<td>1.02</td>
<td>17.29</td>
<td>.000*</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>4.15</td>
<td>.79</td>
<td>3.40</td>
<td>.96</td>
<td>17.00</td>
<td>.000*</td>
</tr>
<tr>
<td>Independent Projects</td>
<td>3.91</td>
<td>.98</td>
<td>2.99</td>
<td>1.05</td>
<td>16.86</td>
<td>.000*</td>
</tr>
</tbody>
</table>

* = Significant at the p< .0025 level

As Table 4.6.2.2 shows, the instructional strategy with the greatest difference was ‘independent study’ (M₁ - M₂ = 1.15, t = 22.51, p< .001). Preservice teachers would use independent study far more frequently with students without LD than they would with students with LD. ‘Higher-level thinking’ (M₁ - M₂ = .98, p< .001, t = 19.59), ‘student led discussion’ (M₁ - M₂ = .84, p< .001, t = 17.29), ‘problem solving’ (M₁ - M₂ = .75, p< .001, t = 17.00), and ‘independent projects’ (M₁ - M₂ = .92, p< .001, t = 16.86) are also perceived to be far more frequently used with students without LD than students with LD, even though the literature states that these strategies are just as
important for students with LD as they are for other students (Bender, 2002; Butler, 1995; Davies, 2004; Reid & Lienemann, 2006; Swanson, 2001; Ysseldyke & Algozzine, 2006), as will be discussed in the next chapter.

As well as the above five instructional strategies producing the greatest significant differences concerning frequency of use between students with and students without LD, it is also worth noting here that there are differences amongst the two groups of students on the frequency ranking of instructional strategies.

Table 4.6.2.2.1. *Ranking of the Higher Cognitive Level Instructional Strategies used towards Students with and without LD*

<table>
<thead>
<tr>
<th>Rank Order Number</th>
<th>Strategy</th>
<th>Rank Order Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Problem Solving</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>Higher-Level Thinking</td>
<td>14</td>
</tr>
<tr>
<td>6</td>
<td>Student Led Discussion</td>
<td>13</td>
</tr>
<tr>
<td>7</td>
<td>Independent Projects</td>
<td>16</td>
</tr>
<tr>
<td>10</td>
<td>Independent Study</td>
<td>19</td>
</tr>
</tbody>
</table>

As Table 4.6.2.2.1 shows, the five higher cognitive level instructional strategies are ranked as five of the top ten most frequent strategies that preservice teachers would use for students without LD. Moreover, the five higher cognitive level instructional strategies are ranked in the bottom ten most frequent strategies that they would use for students with LD. These different perceptions indicate the difference in opportunities likely to occur for students with LD in comparison to students without LD in the classroom.
4.6.2.3 Instructional Strategies used with No Differences

From the twenty instructional strategies used in this study only four, as shown in Table 4.6.2.3, resulted in no significant differences in regards to the advocated frequency of use for students with and without LD.

Table 4.6.2.3. Strategies used with No Significant Differences of Usage between Students with and without LD

<table>
<thead>
<tr>
<th>Strategies</th>
<th>NLD M</th>
<th>NLD SD</th>
<th>LD M</th>
<th>LD SD</th>
<th>Overall M</th>
<th>Overall SD</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variety of Materials</td>
<td>4.48</td>
<td>.76</td>
<td>4.45</td>
<td>.80</td>
<td>.97</td>
<td>.331</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tiered Assignments</td>
<td>3.39</td>
<td>1.11</td>
<td>3.45</td>
<td>1.17</td>
<td>-1.09</td>
<td>.278</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teacher Led Discussion</td>
<td>3.59</td>
<td>.96</td>
<td>3.65</td>
<td>1.04</td>
<td>-1.31</td>
<td>.189</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning Contracts</td>
<td>3.51</td>
<td>1.09</td>
<td>3.43</td>
<td>1.17</td>
<td>1.41</td>
<td>.158</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The intended use of ‘variety of materials’ was not only the strategy with the least significant difference ($M_1 - M_2 = .03$, $p = .331$, $t = .97$), it was also the most frequently perceived strategy for students with and without LD. Having ‘tiered assignments’ in the classroom was also similar in usage for students with and without LD ($M_1 - M_2 = .06$, $p = .278$, $t = -1.09$). Interestingly, but not necessarily surprisingly, although there were no significant differences between ‘teacher led discussion’ for students with and without LD, the strategy is one of the least common amongst students without LD (ranked 13th), yet for students with LD it is one of the most common strategies preservice teachers expected to use (ranked 5th). ‘Learning contract’ was the only other strategy that had no significant difference ($M_1 - M_2 = .08$, $p = .158$, $t = 1.41$).
From the twenty instructional strategies used in this study only three, as shown in Table 4.6.2.4, resulted in significant differences relating to higher perceived frequency of usage amongst students with LD than students without LD. The instructional strategy with the greatest difference was ‘modelling’ (M₁ - M₂ = .25, p< .001, t = -6.48). ‘Modelling’ was perceived to be used more frequently for students with LD than their counterparts. The other instructional strategies that were also perceived to be used more frequently for students with LD were ‘individual instruction’ (M₁ - M₂ = .38, p< .001, t = -5.80), and the use of ‘learning centres’ (M₁ - M₂ = .33, p< .001, t = -5.54).

<table>
<thead>
<tr>
<th>Strategies used More Frequently towards Students with LD in Comparison to Students without LD</th>
<th>NLD</th>
<th>LD</th>
<th>Overall Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modelling</td>
<td>4.06</td>
<td>4.31</td>
<td>-6.48</td>
</tr>
<tr>
<td>Individual Instruction</td>
<td>3.24</td>
<td>3.62</td>
<td>-5.80</td>
</tr>
<tr>
<td>Learning Centres</td>
<td>3.42</td>
<td>3.75</td>
<td>-5.54</td>
</tr>
</tbody>
</table>

* = Significant at the < .0025 level

There were only two other instructional strategies that were perceived by preservice teachers to be used more frequently with students with LD than students without LD. These were ‘teacher led discussion’ and the use of ‘tiered assignments’. However, neither of these yielded significant differences. All other fifteen strategies were perceived to be used more frequently for students without LD than students with LD.
Previously, the findings on attitudes towards students with LD and comparison of instructional strategies used for students with and without LD were presented. The findings from a MANOVA analysis, which compared selected sub-samples of preservice teachers with high positive or low negative attitudes towards students with LD, will now be discussed.

### 4.6.3 LD Attitude and Instructional Strategies

A MANOVA was carried out using the data file with only respondents at either extreme of the LD attitude scale (as discussed in section 3.7.6). This was to analyse whether any of the instructional strategies differed, in regards to frequency between preservice teachers with high positive and low negative attitudes towards students with LD.

Table 4.6.3. Significant Differences between Higher Cognitive Level Instructional Strategies used with Preservice Teachers with High (Positive) and Low (negative) Attitudes towards Students with LD

<table>
<thead>
<tr>
<th></th>
<th>Low LD</th>
<th>High LD</th>
<th>F</th>
<th>p</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD Instructions</td>
<td>2.85</td>
<td>3.25</td>
<td>16.499</td>
<td>.000*</td>
<td>.093</td>
</tr>
</tbody>
</table>

* = Significant at the .05 level

Table 4.6.3 shows the scale variable ‘LD Instruct’, which consists of the five higher cognitive level instructional strategies (created through factor analysis), was computed and found significant (M₁ - M₂ = .405, F (1, 162) = 16.499, p = .000, η² = .093). Thus the higher (more positive) the attitude towards students with LD, the more frequently higher cognitive level instructional strategies were selected by preservice teachers for students with LD (see Appendix 26).
Results from the MANOVA test on all twenty individual instructional strategies for students with LD, show three instructional strategies (from the original twenty) that were significantly different from preservice teachers with high positive, to preservice teachers with low negative attitudes towards students with LD. Interestingly, as Table 4.6.3.1 shows, those three strategies are: higher-level thinking ($M_1 - M_2 = .587$, $F(1, 115) = 10.703$, $p < .0025$, $\eta^2 = .087$), problem solving ($M_1 - M_2 = .527$, $F(1, 115) = 9.221$, $p < .0025$, $\eta^2 = .075$), and student led discussions ($M_1 - M_2 = .557$, $F(1, 115) = 11.005$, $p < .0025$, $\eta^2 = .089$). These three instructional strategies are all within the group of higher cognitive level instructional strategies that was identified through the factor analysis earlier. These findings show that preservice teachers with a higher positive attitude towards students with LD would use higher level thinking, problem solving, and student led discussions significantly more frequently than their counterparts with low negative attitudes towards these students (see Appendix 26).

Table 4.6.3.1. Significant Differences between Instructional Strategies used with Preservice Teachers with High (Positive) and Low (negative) Attitudes towards Students with LD

<table>
<thead>
<tr>
<th></th>
<th>Low LD Attitude Mean</th>
<th>High LD Attitude Mean</th>
<th>F</th>
<th>p</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = 53</td>
<td>N = 62</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher-Level Thinking</td>
<td>2.74</td>
<td>3.32</td>
<td>10.70</td>
<td>.001*</td>
<td>.087</td>
</tr>
<tr>
<td>Problem Solving</td>
<td>3.04</td>
<td>3.56</td>
<td>9.22</td>
<td>.002*</td>
<td>.075</td>
</tr>
<tr>
<td>Student-led Discussion</td>
<td>2.72</td>
<td>3.27</td>
<td>11.01</td>
<td>.001*</td>
<td>.089</td>
</tr>
</tbody>
</table>

* = Significant at the < .0025 level

Furthermore, it is worth noting that from the twenty original instructional strategies used in the study, there were three strategies that resulted in more frequent use for those preservice teachers who had a more negative attitude towards students with LD than their counterparts. However, none of them were significantly different (see Appendix 26). Preservice teachers with lower negative attitudes towards students with LD used ability grouping ($M_1 - M_2 = .02$, $F(1, 115) = -.012$, $p > .0025$), workbook activities ($M_1 - M_2 = .41$, $F(1, 115) = -5.588$, $p > .0025$), and teacher led discussions
(M₁ - M₂ = .08, F (1, 115) = -.172, p > .0025) more frequently than those with higher positive attitudes. All other instructional strategies had no significant differences between preservice teachers with high positive and low negative attitudes towards students with LD. However, it is worth noting that except for the three instructional strategies discussed above (ability grouping, workbook activities, and teacher led discussions) all of the other strategies were used more frequently by preservice teachers who had a higher positive attitude towards students with LD. Moreover, with the exception of the three higher cognitive level instructional strategies (higher-level thinking, problem solving, and student led discussions) none of them were significantly different.

4.7 ATTITUDE AND EFFICACY CORRELATIONS

A correlation analysis was conducted to evaluate whether correlations existed between preservice teachers’ attitudes towards students with LD, attitudes towards differentiating the curriculum for diverse learners, general teacher efficacy, and personal teacher efficacy. In Table 4.7.1 a correlation matrix between the scale variables is presented. These scale variables were initially created through factor analysis prior to analysing any data (as discussed in section 3.7.5).

<table>
<thead>
<tr>
<th></th>
<th>LD Attitude</th>
<th>Diff Attitude</th>
<th>GTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Differentiation</td>
<td>.393**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td>.329**</td>
<td>.422**</td>
</tr>
<tr>
<td>GTE</td>
<td>-.027</td>
<td>-.014</td>
<td>.038</td>
</tr>
<tr>
<td>PTE</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** = Significant below .01 level.
Table 4.7.1 shows that inter-correlations between preservice teachers’ attitudes towards students with LD, attitudes towards differentiating the curriculum, and general teacher efficacy were all moderately correlated to one another. The moderate correlations between these scale variables are positively correlated. Thus, the higher one’s general teacher efficacy level, the more positive one’s attitude is towards students with LD, and differentiating the curriculum. Generally, correlations between the individual statements within these three scale variables correlated with one another. However, these correlations are small to moderate (see Appendix 27).

Conversely, the scale variable of personal teacher efficacy did not correlate with any of the other scale variables. As can be seen in Appendix 27, the individual statements within the personal teacher efficacy subscale generally did not correlate significantly with any of the individual statements within the preservice teachers’ attitudes towards students with LD, differentiating the curriculum, or general teacher efficacy.

### 4.8 EFFECTS OF ATTITUDES AND TEACHER EFFICACY ON ATTRIBUTIONAL RESPONSES

To analyse whether any of the attributional responses towards students with LD differed between preservice teachers with high positive and low negative attitudes and high and low teacher efficacy, a MANOVA was carried out. To consider the independent measures of preservice teachers’ attitudes and teacher efficacy, individual MANOVAs were also carried out. These analyses were carried out for each scale variable created from the factor analysis (viz. LD attitude, differentiation attitude, general teacher efficacy, and personal teacher efficacy). These analyses were only carried out with respondents at either end of each scale being analysed (as discussed in section 3.7.6).

The investigator for each MANOVA endeavoured to select the top and bottom 100-125 respondents, with natural breaks of scores. Table 4.8 shows the number and percentage of respondents used for each MANOVA. Four separate MANOVAs were conducted with the sixteen vignette responses to test for significant differences.
Table 4.8. Number of Respondents used in the MANOVAs

<table>
<thead>
<tr>
<th>MANOVA</th>
<th>Scale Variable</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>1</td>
<td>LD Attitude</td>
<td>94</td>
<td>49</td>
</tr>
<tr>
<td>2</td>
<td>Differentiation Attitude</td>
<td>136</td>
<td>51</td>
</tr>
<tr>
<td>3</td>
<td>General Teacher Efficacy</td>
<td>111</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>Personal Teacher Efficacy</td>
<td>118</td>
<td>45</td>
</tr>
</tbody>
</table>

4.8.1 Effects of LD Attitudes on Attributional Responses

As Table 4.8.1 shows, the only significant differences between preservice teachers with high positive and low negative attitudes towards students with LD was concerned with their expectation of future failure.

Table 4.8.1. Differences Amongst Preservice Teachers with High (Positive) and Low (Negative) Attitudes towards Students with LD

<table>
<thead>
<tr>
<th>MANOVA</th>
<th>Low Mean</th>
<th>High Mean</th>
<th>f</th>
<th>df</th>
<th>Sig.</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD Attitude</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multivariate</td>
<td>1.928</td>
<td>16</td>
<td>.021*a</td>
<td>.150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brian Fail</td>
<td>5.32</td>
<td>4.82</td>
<td>9.252</td>
<td>1</td>
<td>.003*b</td>
<td>.046</td>
</tr>
<tr>
<td>James Fail</td>
<td>4.53</td>
<td>4.02</td>
<td>11.502</td>
<td>1</td>
<td>.001*b</td>
<td>.057</td>
</tr>
</tbody>
</table>

*a a = Significant at the .05 level
*b b = Significant at the .003 level
Preservice teachers’ expectation of future failure for students with LD who expend low effort significantly differed between those with positive attitudes and those with negative attitudes towards them. The greatest difference was towards James who is LD, of a high ability, and expends low effort (F (1, 192) = 11.502, \( \eta^2 = .057 \), p = .003), followed by Brian who is LD, of a low ability, and expends low effort (F (1, 192) = 9.252, \( \eta^2 = .046 \), p = .001). Thus, preservice teachers with a higher positive attitude towards students with LD, who expend low effort, have a significantly lower expectation of future failure for them (Brian: \( M_1 - M_2 = -.50 \); James: \( M_1 - M_2 = -.51 \)). Moreover, those with a lower negative attitude towards students with LD, who expend low effort, have a significantly higher expectation of future failure towards them (see Appendix 28).

### 4.8.2 Effects of Differentiation Attitudes on Attributional Responses

No significant differences resulted between preservice teachers with high positive and low negative attitudes towards differentiating the curriculum (see Table 4.8.2).

| Table 4.8.2. Differences Amongst Preservice Teachers with High (Positive) and Low (Negative) Attitudes towards Differentiating the Curriculum |
|-----------------|-----------------|-----------------|----------------|-----------------|-----------------|-----------------|
| MANOVA          | Low Mean        | High Mean       | f              | df              | Sig.            | \( \eta^2 \)     |
| Diff Attitude   |                 |                 |                |                 |                 |                 |
| Multivariate    | 1.454           | 16              | .118           | .085            |                 |                 |

*\( a \) = Significant at the .05 level

Thus, preservice teachers’ feedback, levels of frustration and sympathy, and expectation of future failure of students with LD, do not differ amongst preservice teachers of varying attitudes towards differentiating the curriculum.
4.8.3 Effects of General Teacher Efficacy on Attributional Responses

General teacher efficacy significantly affects preservice teachers’ frustrations towards students with LD. However, as Table 4.8.3 shows, this is only towards those students with LD who expend high effort.

Table 4.8.3. Differences Amongst Preservice Teachers with High and Low General Teacher Efficacy

<table>
<thead>
<tr>
<th>MANOVA</th>
<th>Low Mean</th>
<th>High Mean</th>
<th>f</th>
<th>df</th>
<th>Sig.</th>
<th>Partial Eta Squared</th>
</tr>
</thead>
<tbody>
<tr>
<td>GTE Multivariate</td>
<td></td>
<td>1.925</td>
<td>16</td>
<td>.020*</td>
<td>.131</td>
<td></td>
</tr>
<tr>
<td>Andrew Frustration</td>
<td>2.94</td>
<td>2.32</td>
<td>15.001</td>
<td>1</td>
<td>.000*b</td>
<td>.064</td>
</tr>
<tr>
<td>Steven Frustration</td>
<td>3.05</td>
<td>2.48</td>
<td>13.925</td>
<td>1</td>
<td>.000*b</td>
<td>.060</td>
</tr>
</tbody>
</table>

*a = Significant at the .05 level

*b = Significant at the .003 level

Preservice teachers’ frustrations towards students with LD who expend high effort significantly differed between those with a high general teacher efficacy level and those with a low general teacher efficacy level. The greatest difference in frustration felt was towards Andrew who is LD, of a low ability, and expends high effort (F (1, 222) = 15.001, \( \eta^2 = .064 \), \( p = .000 \)), followed by Steven who is LD, of a high ability, and expends high effort (F (1, 222) = 13.925, \( \eta^2 = .060 \), \( p = .000 \)). Thus, preservice teachers with a higher level of general teacher efficacy have significantly lower feelings of frustration towards students with LD who expend high effort (Andrew: \( M_1 - M_2 = -.62 \); Steven: \( M_1 - M_2 = -.57 \)). Moreover, those with a lower level of general teacher efficacy have significantly higher feelings of frustration towards students with LD who expend high effort. No other significant differences between preservice teachers with high and low general teacher efficacy resulted (see Appendix 28).
4.8.4 Effects of Personal Teacher Efficacy on Attributional Responses

As Table 4.8.4 shows, personal teacher efficacy does not significantly affect preservice teachers’ attributional responses towards students with LD.

Table 4.8.4. Differences Amongst Preservice Teachers with High and Low Personal Teacher Efficacy

<table>
<thead>
<tr>
<th>MANOVA</th>
<th>Low Mean</th>
<th>High Mean</th>
<th>f</th>
<th>df</th>
<th>Sig.</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTE Multivariate</td>
<td>1.446</td>
<td>16</td>
<td>.121</td>
<td>.087</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a = Significant at the .05 level

Thus, preservice teachers’ feedback, levels of frustration and sympathy, and expectation of future failure of students with LD, do not differ amongst preservice teachers of varying personal teacher efficacy levels.

The findings presented thus far have discussed the theoretical analysis of components individually, and through correlation matrices and MANOVA analyses, which discussed links between components. The next section, which focuses on structural equation modelling, will present further detailed analysis on how these theoretical components link together.

4.9 STRUCTURAL EQUATION MODELLING

In this section, a structural equation model was developed to estimate and test the theoretical relationships among preservice teachers’ attitudes toward students with
LD, attitudes toward differentiating the curriculum for diverse students, general teacher efficacy, and personal teacher efficacy. A second aim was to examine how these variables influence the attributional responses and instructional strategies used for students with LD that were developed in the literature review process (hypothesised model).

### 4.9.1 Maximum Likelihood Estimation Method

The most frequently used estimation method, according to Tabachnik and Fidell (2001) is Maximum Likelihood (ML). However, typically either ML or Generalised Least Squares (GLS) are used (Byrne 2001). This study used ML estimation when developing the model. Nevertheless, for post-hoc validation purposes, the investigator estimated the model using GLS estimation to check that the model was not overfitting. A comparison between the ML results for the final model and those that would have come from GLS will be discussed (see section 4.10.2.6.1).

The ML estimate is good for larger samples in SEM (Byrne, 2001). Hair et al. (2006) suggest that around 200 is an ideal sample size when using ML estimation, as it is likely to produce a sound basis for estimation. Due to having a large sample size, the investigator was able to split the sample into two groups, thus having around the ideal sample size to develop the model. The investigator was then also able to validate and compare the model with the remaining sample set. The models were developed using the first set of sample data. The second set of sample data was then used for post-hoc validation of the final structural model, which will be discussed in section 4.10.2.6.

### 4.9.2 Measurement Fit of the Model

No single measure has been found to sufficiently describe the adequacy of the fit between a predicted model and empirical data. All models are incorrect to some degree, but the aim was to develop a meaningful model that would fit the observed data reasonably well. A number of measures of goodness-of-fit have been developed.
MacCallum and Austin (2000) claim that it is vital to use fit indices to determine if a model is plausible. Furthermore, they state that there is a lack of consensus as to which goodness of fit indices should be used (2000). However, there have been suggestions that some goodness of fit indices should be included in the testing of the models. Models that fit the data well often produce consistently good results across many of the goodness-of-fit indices that have been created. The following fit indices have been chosen for this study and are discussed below together with the justification for their use.

The $\chi^2$ Statistic: The simplest measure of overall fit is using the $\chi^2$ (chi-square) statistic. This indicates how well an analysis succeeded in minimising the discrepancy between the hypothesised covariance matrix and the sample covariance matrix (Hoyle & Panter, 1995). That is, the smaller the $\chi^2$ statistic the better the fit. In contrast to most other statistical tests, the aim is to find a non-significant difference (i.e. $p > .05$), which indicates an adequate fit. However, it does need to be mentioned that caution is needed when interpreting the $\chi^2$ statistic, as questions and criticisms have been raised about its use as a test of model fit (Bollen & Long, 1993; Hoyle, 1995; MacCallum, Browne & Sugawara, 1996; Ullman, 2001). Because of the $\chi^2$ statistic’s sensitivity to sample size it can become prone to reject the null hypothesis with increasing sample size.

However, the investigator included this statistic into the analysis, for hierarchical model development purposes. That is, as each measurement and structural model was developed the $\chi^2$ statistic was used to test whether each change to the model made a significantly positive fit amendment to the model (for model modification see section 4.9.3).

The $\chi^2$/df Ration (CMIN/DF): Because of the problems discussed previously with the $\chi^2$ statistic, researchers have developed a number of alternative goodness-of-fit indices (Byrne, 2001; Hoyle, 1995). One of the first indices to address the problems was the $\chi^2$/degrees of freedom ration (CMIN/DF). It takes into account the sample size and is designed to compensate for the tendency of the $\chi^2$ test to reject
models that have large sample sizes. Values that are less than 2 represent a good fit (Byrne, 2001).

The Standardised Root Mean Squared Residual (SRMSR): The Root Mean Squared Residual (RMSR) is the average residual value which comes from the variance-covariance matrix fitting for the hypothesised model to the data set (Byrne, 2001). Models of good fit would have low RMSR; however, caution is necessary with these scores as the scale of variables affects the size of the residual, thus making the scores difficult to interpret (Byrne, 2001). For this reason, it is suggested that the standardised root mean squared residual (SRMSR) is calculated (Hu & Bentler, 1998; MacCallum & Austin, 2000), and values of 0.08 or less are suggested to indicate good fit (Ullman, 2001).

The Root Mean-Square Error of Approximation Index (RMSEA): The RMSEA also attempts to correct for the $\chi^2$ statistic’s tendency to reject any model with a large sample. The RMSEA is similar to that of the RMSR in that it is the discrepancy per degree of freedom. However, the RMSEA measures the discrepancy in terms of population, not just the sample used. It represents a goodness-of-fit that could be expected if the models were estimated in the population, not just the sample (Hair et al., 2006). This is particularly useful and encouraged by researchers, due to the particular sensitivity to model misspecification, and tends to yield appropriate conclusions about model quality (Hu & Bentler, 1998; MacCallum & Austin, 2000). Values of 0.05 or less indicate the model is a close fit to the sample data (Hair et al., 2006), however, Browne and Cudeck (1993) suggest that models with RMSEA values of 0.08 or less can be accepted.

The Tucker-Lewis Index (TLI): The Tucker-Lewis Index (TLI) is an incremental fit measure which was first proposed as a means of evaluating factor analysis, and is now extended to SEM (Hair et al., 2006). The TLI is recommended when the ML estimation method is used (Hoyle & Panter, 1995), as in the case of this study. The TLI combines a measure of parsimony into a comparative index. The TLI should be greater than 0.95 (Hu & Bentler, 1995) although values greater than 0.90 may indicate reasonable fit (Hair et al., 2006).
The Comparative Fit Index (CFI): The Comparative Fit Index (CFI) is a revised version of the Normed Fit Index (NFI), developed by Bentler and Bonnet (1980). It represents comparisons between the estimated model and a null or independent model, and unlike the NFI, the CFI takes into account the sample size (Byrne, 2001). The CFI is particularly found to be more appropriate in a model development strategy, as is the case in this study. The CFI value lies in the range 0 – 1 and the larger the value, the higher the degree of goodness-of-fit. However, although .90 is an acceptable score, it is suggested that values close to 0.95 indicate superior fit (Byrne, 2001).

Hoelter (CN): The final of the fit indices that this study will report is Hoelter’s (1983) critical N (CN). This statistic differs markedly from the previous ones outlined in that it uses a sample size estimate as a means of assessing a model fit. Hoelter’s statistic (labelled as Hoelter’s .05 and .01 indexes) specifically measures fit by referring to the sample size needed for the fit to be viewed as adequate. Values in excess of 200 are viewed as suitable. Less than 200 may indicate inferior fit.

Based on the above discussions and recommendations, the following table shows the indices and the acceptance levels used in this research:

<table>
<thead>
<tr>
<th>Fit Indices</th>
<th>Acceptable Goodness-of-Fit Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$(Prob)</td>
<td>Absolute Fit Measure</td>
</tr>
<tr>
<td>CMIN/DF:</td>
<td>Absolute Fit Measure</td>
</tr>
<tr>
<td>SRMSR</td>
<td>Absolute Fit Measure</td>
</tr>
<tr>
<td>RMSEA</td>
<td>Absolute Fit Measure</td>
</tr>
<tr>
<td>TLI</td>
<td>Incremental Fit Measure</td>
</tr>
<tr>
<td>CFI</td>
<td>Incremental Fit Measure</td>
</tr>
<tr>
<td>PGFI*</td>
<td>Parsimonious Fit Measure</td>
</tr>
<tr>
<td>CN</td>
<td>Population Measure</td>
</tr>
<tr>
<td></td>
<td>$p &gt; .05$</td>
</tr>
<tr>
<td></td>
<td>$&lt; 2.00$</td>
</tr>
<tr>
<td></td>
<td>$&lt; .08$</td>
</tr>
<tr>
<td></td>
<td>$&lt; .05$</td>
</tr>
<tr>
<td></td>
<td>$&gt; .90$</td>
</tr>
<tr>
<td></td>
<td>$&gt; .90$</td>
</tr>
<tr>
<td></td>
<td>$&gt; .60$</td>
</tr>
<tr>
<td></td>
<td>$&gt; 200$</td>
</tr>
</tbody>
</table>

* = PGFI is included in the development of the structural model analyses and will be discussed in section 4.10.2.2.
4.9.3 Model Modification

According to Schumacker and Lomax (2004) if the original hypothesised model from the theoretical literature does not yield as good a fit as desired with the data sample, then the model should be modified and the new modified model evaluated. In modifying the research model, the modifications that were theoretically driven primarily guided the changes. This supports Hair et al.’s (2006) claim that theory must guide the modifications. Modifications to the model either included fixing the parameters that were free or freeing parameters that were fixed. The basis for the modifications in this study involved an examination of the modification indices (MI). MIs provide information about changes to the $\chi^2$ that would result if parameters that were fixed, were free.

This analysis began with the initial measurement models (latent variables that derived from the original factor analyses), gradually building up the structural models towards the hypothesised model. Moreover, through testing and examining each model, the MIs made individual changes to the models as they were developed and re-tested. The investigator examined the MIs after each test of the individual models, and the MI with the largest change to the $\chi^2$, that made theoretical sense, was carried out. Only single changes were made each time before retesting of the model. If the highest MI score change was not theoretically sound the investigator then examined the second highest score and if that made theoretical sense, then the change was carried out. If not then the third highest score was examined. This process continued until either a theoretically sound change was found, or until no further theoretically sound MIs were identified.

This process of changes to each model continued until an adequate model fit was confirmed. The investigator stopped adjusting each model once there was acceptable fit, rather than continue to try and gain a better fit (often referred to as overfitting). Overfitting refers to the specification of additional parameters in a model after having determined a criterion that reflects a minimally adequate fit (Byrne, 2001). This
process was used by the investigator when developing the individual measurement models, as well as each structural model, leading towards the final structural model.

Due to the complexity of the models developed the subsequent reports of the developments of each measurement model do not include detail on each of the individual covariance paths that were added in the development of each model. However, each covariance path that was added for each measurement model and combined models is clearly included at the end of each of their specified appendices.

4.10 STRUCTURAL EQUATION MODEL DEVELOPMENT

The structural equation model was developed by firstly producing six measurement models and then combining the attitudinal and efficacious measurement models into one. Finally structural equation models were created between, firstly, the combined model and the instructional strategies measurement model; secondly, the combined model and the attributional variables; finally a complete structural equation model combining all of the variables and measurement models into a single model was developed.

4.10.1 Development of the Measurement Models

Each of the six measurement models derived from the original factor analyses carried out for the earlier analyses (as discussed in sections 3.7.5 and 3.7.6.2) and the literature. In the following sections, different measurement models are investigated: Figure 4.10.1 contains the five measures which define the attitude towards students with LD; Figure 4.10.2 contains the six measures which define the attitude towards differentiating the curriculum for diverse students; Figure 4.10.3 contains the five measures which define general teacher efficacy; Figure 4.10.4 contains the five measures which define personal teacher efficacy; Figure 4.10.5 contains the five instructional strategies which define higher level instructional strategies; and, Figure 4.10.6 contains the four attributional responses of feedback, frustration, sympathy, and future expectations of failure, toward students with LD. It is necessary to note
here that although the names of the latent variables (throughout the structural equation modelling) are the same as the sub-scale variables discussed in the earlier analyses (such as general teacher efficacy), they are not an exact replication. Although they are theoretically similar, they are empirically different from one another in the way they were developed. It is also worth noting here that although there are five sections of the survey instrument, only the four parts of the questionnaire (attributional vignettes, attitudes, teacher efficacy, and instructional strategies) are referred to throughout the remainder of this chapter (as shown in Appendix 1).

### 4.10.1.1 Measurement Model One

![Diagram of Measurement Model One](image)

**Figure 4.10.1. Measurement Model One. LD Attitude**

Measurement model one is the latent variable for attitudes toward students with LD (LD Att), which is derived from five measures. The five measures are from Part Two of the survey instrument which focused on attitudinal statements (see Part 2 of Appendix 1 where the LD attitude statements are found). Only one covariance path was added to the original model (see Appendix 29). The greatest contributors (factor loadings) to the LD attitude latent variable are statements p201 and p209 which both focus on statements referring to students with LD being low/poor achievers in most subjects. Thus, the regression weight value of 1 was assigned to regression path ‘p201’ → ‘LD Att’. As Table 4.10.1 shows, measurement model one fits all of the
required criteria in the goodness-of-fit indices, and so it can be concluded that this measurement model is an extremely good fit (see Appendix 29).

Table 4.10.1. Measurement Model One Statistics

<table>
<thead>
<tr>
<th>Thesis Criteria</th>
<th>Measurement Model 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>5.595</td>
</tr>
<tr>
<td>df</td>
<td>4</td>
</tr>
<tr>
<td>Probability</td>
<td>&gt; .05</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>&lt; 2.00</td>
</tr>
<tr>
<td>SRMSR</td>
<td>&lt; .08</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>TLI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CN: .05 / .01</td>
<td>&gt; 200</td>
</tr>
</tbody>
</table>

* = Statistics fall outside the criteria adopted in this study

4.10.1.2 Measurement Model Two

Figure 4.10.2. Measurement Model Two. Differentiation Attitude
Measurement model two is the latent variable for attitudes toward differentiating the curriculum for diverse learners (Diff Att), which is derived from six measures. The six measures are from Part Two of the survey instrument which focused on attitudinal statements (see Part 2 of Appendix 1 where the statements regarding differentiation attitudes are found). There were two covariance paths added to the original model (see Appendix 30).

Table 4.10.2. Measurement Model Two Statistics

<table>
<thead>
<tr>
<th>Thesis Criteria</th>
<th>Measurement Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>11.530</td>
</tr>
<tr>
<td>df</td>
<td>7</td>
</tr>
<tr>
<td>Probability</td>
<td>&gt; .05</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>&lt; 2.00</td>
</tr>
<tr>
<td>SRMSR</td>
<td>&lt; .08</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>TLI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CN: .05 / .01</td>
<td>&gt; 200</td>
</tr>
<tr>
<td></td>
<td>292 / 383</td>
</tr>
</tbody>
</table>

* = Statistics fall outside the criteria adopted in this study

The greatest contributor (factor loading) to the differentiation attitude latent variable is statement p214 which declares that all students in the class should be taking the same tests. Therefore the regression weight value of 1 was assigned to regression path ‘p214’ $\rightarrow$ ‘Diff Att’. Table 4.10.2 shows that measurement model two fits all of the required criteria in the goodness-of-fit indices (except it is very slightly greater than the acceptable level for the RMSEA value). All statistical data for measurement model two can be found in Appendix 30.
Measurement model three represents the latent variable for general teacher efficacy (GTE), which is derived from five measures. These five measures are from Part Three of the survey instrument which focused on teacher efficacy statements (see Part 3 of Appendix 1). There was just one covariance path added to the original model (see Appendix 31).

The greatest contributor (factor loading) to the general teacher efficacy latent variable is statement p304 which refers to believing that teachers are limited in what they can do due to the large home environment influence. As a result, the regression weight value of 1 was assigned to regression path ‘p304’ → ‘GTE’. Table 4.10.3 shows that measurement model three fits all of the required criteria in the goodness-of-fit indices, and so it can be concluded that this measurement model represents a very good fit (see Appendix 31).
Table 4.10.3. *Measurement Model Three Statistics*

<table>
<thead>
<tr>
<th></th>
<th>Thesis Criteria</th>
<th>Measurement Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td></td>
<td>3.246</td>
</tr>
<tr>
<td>df</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Probability</td>
<td>&gt; .05</td>
<td>.518</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>&lt; 2.00</td>
<td>.812</td>
</tr>
<tr>
<td>SRMSR</td>
<td>&lt; .08</td>
<td>.021</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt; .05</td>
<td>.000</td>
</tr>
<tr>
<td>TLI</td>
<td>&gt; .90</td>
<td>1.010</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt; .90</td>
<td>1.000</td>
</tr>
<tr>
<td>CN: .05 / .01</td>
<td>&gt; 200</td>
<td>699 / 978</td>
</tr>
</tbody>
</table>

* = Statistics fall outside the criteria adopted in this study

4.10.1.4 Measurement Model Four

![Diagram of Measurement Model Four](image)

Figure 4.10.4. *Measurement Model Four. Personal Teacher Efficacy*
Measurement model four is the latent variable for personal teacher efficacy (PTE), which is derived from five measures. The five measures are from Part Three of the survey instrument which focused on teacher efficacy statements (see Part 3 of Appendix 1 where the statements regarding personal teacher efficacy are found). There were three covariance paths added to the original model (see Appendix 32).

Table 4.10.4. Measurement Model Four Statistics

<table>
<thead>
<tr>
<th>Thesis Criteria</th>
<th>Measurement Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>2.154</td>
</tr>
<tr>
<td>df</td>
<td>4</td>
</tr>
<tr>
<td>Probability</td>
<td>&gt; .05</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>&lt; 2.00</td>
</tr>
<tr>
<td>SRMSR</td>
<td>&lt; .08</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>TLI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CN: .05 / .01</td>
<td>&gt; 200</td>
</tr>
</tbody>
</table>

* = Items fall outside the criteria adopted in this study

The measures having the greatest regression weights to the personal teacher efficacy latent variable are statements p303 and p309 which refer to teachers trying really hard and getting through to the most difficult students. Thus, the regression weight value of 1 was assigned to regression path ‘p309’ $\rightarrow$ ‘PTE’. Measurement model four fits all of the required criteria in the goodness-of-fit indices (see Table 4.10.4), and so it can be concluded that this measurement model is a very good fit (see Appendix 32).
4.10.1.5 Measurement Model Five

Figure 4.10.5. Measurement Model Five. LD Instructional Strategies

Measurement model five describes the structure of the latent variable for higher cognitive level instructional strategies for students with LD (LD Instructional Strategies), which is derived from five measures. The five measures are from Part Four of the survey instrument which focused on instructional strategies (see Part 4 of Appendix 1 where the higher level instructional strategies are found). There was one covariance path added to the original model (see Appendix 33).

The measures having the greatest regression weights to the LD instructional strategies latent variable are strategies p432 and p4162 which refer to higher-level thinking activities and student-led discussion respectively. Therefore, the regression weight value of 1 was assigned to regression path ‘p4162’ $\rightarrow$ ‘LD Strat’.
Table 4.10.5. Measurement Model Five Statistics

<table>
<thead>
<tr>
<th>Thesis Criteria</th>
<th>Measurement Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>5.358</td>
</tr>
<tr>
<td>df</td>
<td>4</td>
</tr>
<tr>
<td>Probability</td>
<td>&gt; .05</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>&lt; 2.00</td>
</tr>
<tr>
<td>SRMSR</td>
<td>&lt; .08</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>TLI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CN: .05 / .01</td>
<td>&gt; 200</td>
</tr>
<tr>
<td></td>
<td>424 / 593</td>
</tr>
</tbody>
</table>

* = Statistics fall outside the criteria adopted in this study

Table 4.10.5 shows measurement model five fits all of the required criteria in the goodness-of-fit indices, and so it can be concluded that this measurement model is an extremely good fit (see Appendix 33).

4.10.1.6 Measurement Model Six

Measurement model six consists of the attributional responses towards students with LD, which is derived from four measures: feedback, frustration, sympathy, and expectations of future failure (created through factor analysis). Although measurement model six is not explicitly a measurement model as such, it is a model that estimates the covariances between the observed measures (Arbuckle, 1997). The four measures are from Part One of the survey instrument which focused on attributional responses to vignettes consisting of students with and without LD (see Part 1 of Appendix 1 where the LD vignettes can be found). Originally, there were covariance paths linked between all of the attributional responses (feedback, frustration, sympathy, and expectation of future failure) as it was hypothesised that all responses would correlate to one another. However, one covariance path was removed due to lack of correlation between the two variables. This path was between feedback
and sympathy. All other paths were the same as in the originally hypothesised measured model (see Appendix 34).

Figure 4.10.6. Measurement Model Six. Attributional Responses toward Students with LD

Table 4.10.6. Measurement Model Six Statistics

<table>
<thead>
<tr>
<th>Thesis Criteria</th>
<th>Measurement Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>1.017</td>
</tr>
<tr>
<td>df</td>
<td>1</td>
</tr>
<tr>
<td>Probability</td>
<td>&gt; .05</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>&lt; 2.00</td>
</tr>
<tr>
<td>SRMSR</td>
<td>&lt; .08</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>TLI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CN: .05 / .01</td>
<td>&gt; 200</td>
</tr>
</tbody>
</table>

* = Statistics fall outside the criteria adopted in this study
As can be seen in Table 4.10.6 measurement model six fits all of the required criteria in the goodness-of-fit indices, and so it can be concluded that this model is a very good fit (see Appendix 34).

4.10.1.7 Reliability of Measurement Models

Once the measurement models were developed and the goodness-of-fit indices were acceptable, each model was tested for reliability. The composite reliability for each model was calculated. Hair et al. (2006) recommend a minimum figure of 0.70 (Cronbach alpha) for reliability, although, others (such as, Glass & Hopkins, 1996) have suggested that 0.60 (Cronbach alpha) is an acceptable minimum score. As shown in the following table, all measurement models satisfied the reliability score of 0.60 and above. With the exception of model 2 (attitude towards differentiating the curriculum), all models satisfied Hair et al.’s reliability score of 0.70 and above.

Table 4.10.7. Reliability of Measurement Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Constructs</th>
<th>Figure</th>
<th>Sum of Standardised Loadings</th>
<th>Sum of Measurement Errors</th>
<th>Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>LD Attitude</td>
<td>4.10.1</td>
<td>2.85</td>
<td>3.28</td>
<td>.71</td>
</tr>
<tr>
<td>2</td>
<td>Differentiation Attitude</td>
<td>4.10.2</td>
<td>2.76</td>
<td>4.6</td>
<td>.62</td>
</tr>
<tr>
<td>3</td>
<td>General Teacher Efficacy</td>
<td>4.10.3</td>
<td>2.85</td>
<td>3.33</td>
<td>.71</td>
</tr>
<tr>
<td>4</td>
<td>Personal Teacher Efficacy</td>
<td>4.10.4</td>
<td>2.79</td>
<td>3.22</td>
<td>.70</td>
</tr>
<tr>
<td>5</td>
<td>LD Instructional Strategies</td>
<td>4.10.5</td>
<td>2.87</td>
<td>3.26</td>
<td>.72</td>
</tr>
</tbody>
</table>
4.10.2 Development of the Structural Models

4.10.2.1 Combined Model

Prior to developing the hypothesised structural model (see Figure 3.7.6.2) individual measurement models one to four (attitude and teacher efficacy models), were combined into one single model. The model here included the four latent variables and their 21 observed indicators.

Figure 4.10.8. Combined Model: Attitude and Teacher Efficacy

The combined model incorporated each of the individual measurement models (one to four). Initially each individual measurement model was included as they were in their
final developed state (as described previously). There were seven covariance paths added to the combined model after joining the four individual models (see Appendix 35).

Table 4.10.8. Combined Model Statistics

<table>
<thead>
<tr>
<th>Thesis Criteria</th>
<th>Combined Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>192.724</td>
</tr>
<tr>
<td>Df</td>
<td>169</td>
</tr>
<tr>
<td>Probability</td>
<td>&gt; .05</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>&lt; 2.00</td>
</tr>
<tr>
<td>SRMSR</td>
<td>&lt; .08</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>TLI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CN: .05 / .01</td>
<td>&gt; 200</td>
</tr>
</tbody>
</table>

* = Items fall outside the criteria adopted in this study

The greatest correlations between the latent variables are between ‘LD Attitude’ and ‘Diff Attitude’ (.49); ‘Diff Attitude’ and ‘GTE’ (.60); and, ‘LD Attitude’ and ‘GTE’ (.36). As Figure 4.10.8 shows, there was very little correlation between personal teacher efficacy and the other latent variables (as was the finding in the correlation matrix analysis presented earlier). This is supported by the low critical ratios between ‘PTE’ and ‘LD Attitude’ (CR = -.586, p = .558), ‘Diff Attitude’ (CR = -.387, p = .699), and ‘GTE’ (CR = .624, p = .533). Thus, when developing the structural models, the covariance links between the ‘PTE’ latent variable and the other latent variables were deleted (see Appendix 35). All regression weight values of 1 were assigned to the same regression paths as in the original measurement models. The table above shows the combined model, of the attitude and teacher efficacy latent variables, fits all of the required criteria in the goodness-of-fit indices, and so it can be concluded that this measurement model is a very good fit (see Appendix 35).
4.10.2.2 Structural Equation Model One

The measurement models above were then used in various combinations to produce two initial structural models, and then a final complete structural model. The first two structural models were combinations of the combined model and measurement model five (LD instructional strategies), and the combined model and measurement model six (attributional responses to students with LD) respectively.

As Figure 4.10.9a shows, structural model one initially included the combined measurement model and measurement model five, as they were in their final developed states (as described previously). The aim of this was to examine to what extent preservice teachers’ attitudes and teacher efficacy influence the instructional strategies that they would use for students with LD. As can be seen in Figure 4.10.9b, the final structural model one did not include the ‘Diff Att’ latent variable (measurement model two), or the ‘GTE’ latent variable (measurement model three).
This was due to the fact that the critical ratios (CR) for ‘Diff Att’ (CR = .607, p = .544) and ‘GTE’ (CR = .785, p = .432) were not statistically significant towards the ‘LD Strat’ latent variable (see Appendix 36). This was seen in the standardised regression weight (SRW) scores for both ‘Diff Att’ (.083) and ‘GTE’ (.093). According to Byrne (2001) non-significant parameters can be considered unimportant to the model and should be deleted from the model, if there is an adequate sample size. As the sample size was quite adequate, and the CR and SRW scores were low, it was decided that the two latent variables would be deleted from structural model one.

An adapted model of the initial model was then developed. The only change from the initial model, consisting of the combined measurement model and measurement model five, was the deletion of the ‘Diff Att’ and ‘GTE’ latent variables and their indicators. Thus, any previous covariance paths between them and any other were also deleted.

There were seven covariance paths added to the original measurement model after combining the four individual models together. However, after the deletion of the ‘Diff Att’ and ‘GTE’ latent variables, only two of these covariance paths existed (see

Figure 4.10.9b. Structural Equation Model One. Attitude, Efficacy and Instructional Strategies
Appendix 36). There was also one extra covariance path added to the final model (see Appendix 36). With this exception and the deletion of the two latent variables all other parts of the model have been kept the same.

Figure 4.10.9b shows structural model one between the significant latent variables of attitude towards students with LD and personal teacher efficacy, and the instructional strategies used for students with LD (see Appendix 36 for all statistical details of structural model one).

Table 4.10.9, Structural Model One Statistics

<table>
<thead>
<tr>
<th>Thesis Criteria</th>
<th>SEM 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>99.035</td>
</tr>
<tr>
<td>df</td>
<td>80</td>
</tr>
<tr>
<td>Probability</td>
<td>&gt; .05</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>&lt; 2.00</td>
</tr>
<tr>
<td>SRMSR</td>
<td>&lt; .08</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>PGFI</td>
<td>&gt; .60</td>
</tr>
<tr>
<td>TLI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CN: .05 / .01</td>
<td>&gt; 200</td>
</tr>
</tbody>
</table>

* = Items fall outside the criteria adopted in this study

In the structural model analyses, a parsimonious fit measure was added to the goodness-of-fit measurements. Parsimonious fit measures represent a means of determining the extent to which ‘overfitting’ of the data has occurred as a result of the constraining of too many parameters. The parsimonious goodness-of-fit index (PGFI) was selected as it takes into account the complexity of the hypothesised model in the assessment of overall model fit (Byrne, 2001). Usually the parsimony-based indexes have lower values than the threshold which is usually perceived as acceptable for other goodness-of-fit indexes. Mulaik and colleagues (1989) have suggested that it is
not unusual for parsimonious-fit indexes to be in the .50s with non significant \( \chi^2 \) scores and other goodness-of-fit scores in their acceptable .90s. For these reasons, this study has used a score of .60 and above as an acceptable level for the PGFI.

All regression weight values of 1 were assigned to the same regression paths as in the original measurement models. Structural model one fits all of the required criteria in the goodness-of-fit indices, and so can be concluded that this measurement model is a very acceptable fit (see Table 4.10.9).

4.10.2.3 Structural Equation Model Two

Figure 4.10.10a. Initial Input Structural Equation Model Two. Attitude, Efficacy and Attributional Responses toward Students with LD

Structural model two initially included the combined measurement model and measurement model six, as they were in their final developed states (as described previously). As can be seen in Figure 4.10.10b the final structural model two did not include the ‘Diff Att’ latent variable (measurement model two). This was due to the
fact that none of the critical ratios (CR) for ‘Diff Att’ towards feedback (CR = .750, p = .453), frustration (CR = -.144, p = .886), sympathy (CR = 1.380, p = .168), nor expectation of future failure (CR = -.745, p = .456) were significant. This was seen in the standardised regression weight scores for feedback (.085), frustration (-.017), sympathy (.162), and expectation of future failure (-.085). According to Byrne (2001) non-significant parameters can be considered unimportant to the model and should be deleted from the model, if there is an adequate sample size. As the sample size is ideal, and the CR and SRW scores were low, it was decided that the ‘Diff Att’ latent variable would be deleted from structural model two.

An adapted model of the initial model was then developed. The only changes from the initial model, consisting of the combined measurement model and measurement model six, were, firstly, the deletion of the ‘Diff Att’ latent variable and the indicators. Thus any previous covariance paths between them and any other were also deleted. There were seven covariance paths added to the original combined model after combining the four individual measurement models together. However, after the deletion of the ‘Diff Att’ latent variable, only four specified covariance links existed (see Appendix 37). Just as in structural model one there was also one extra covariance path added to the final model (see Appendix 37).

Figure 4.10.10b. **Structural Equation Model Two. Attitude, Efficacy and Attributional Responses toward Students with LD**
The only other changes to the model were the inclusion of regression paths from the attitude and teacher efficacy latent variables to the LD Response variables (feedback, frustration, sympathy and fail). The changes made were only the deletion of those regression paths that were not statistically significant from zero.

The following regression path deletions were made due to the non-significant critical ratios: ‘LD Att’ to ‘LDFeedFS’ (CR = -.865, p = .387); ‘LD Att’ to ‘LDFrustFS’ (CR = -.240, p = .810); ‘GTE’ to ‘LDSympFS’ (CR = -1.389, p = .165); ‘GTE’ to ‘LDFailFS’ (CR = .174, p = .861); ‘PTE’ to LDFrustFS’ (CR = -1.148, p = .251); and, ‘PTE’ to ‘LDSympFS’ (CR = -1.514, p = .130).

Table 4.10.10. Structural Model Two Statistics

<table>
<thead>
<tr>
<th>Thesis Criteria</th>
<th>SEM 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>143.781</td>
</tr>
<tr>
<td>df</td>
<td>134</td>
</tr>
<tr>
<td>Probability</td>
<td>$&gt;.05$</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>$&lt;2.00$</td>
</tr>
<tr>
<td>SRMSR</td>
<td>$&lt;.08$</td>
</tr>
<tr>
<td>RMSEA</td>
<td>$&lt;.05$</td>
</tr>
<tr>
<td>PGFI</td>
<td>$&gt;.60$</td>
</tr>
<tr>
<td>TLI</td>
<td>$&gt;.90$</td>
</tr>
<tr>
<td>CFI</td>
<td>$&gt;.90$</td>
</tr>
<tr>
<td>CN: .05 / .01</td>
<td>$&gt;200$</td>
</tr>
</tbody>
</table>

* = Statistics fall outside the criteria adopted in this study

All regression weight values of 1 were assigned to the same regression paths as in the original measurement models. Structural model two fits all of the required criteria in the goodness-of-fit indices, as the table above shows, and so it can be concluded that this measurement model is a very acceptable fit (see Appendix 37).
Once structural models one and two were developed, model three was a combination of the previous models into a single model. As structural models one and two were similar, in that they both incorporated the covariance paths between the ‘LD Attitude’ and the ‘PTE’ latent variables, and the original measurement models five and six, a full structural model was attempted and developed merging the two models together. No changes to the initial full model were necessary as all of the fit criteria were acceptable. As Figure 4.10.11 shows, all regression paths, covariance paths and regression weight values were the same as in previous models, thus, no modifications were included in the final model (see Appendix 38 for all statistical details of structural model three).
Figure 4.10.11b. Structural Equation Model Three. Full SEM Model of Attitude, and Teacher Efficacy toward Attributional Responses and Instructional Strategies to Students with LD.

Table 4.10.11. Structural Model Three Statistics

<table>
<thead>
<tr>
<th>Thesis Criteria</th>
<th>SEM 3 (Full Model)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>257.243</td>
</tr>
<tr>
<td>df</td>
<td>231</td>
</tr>
<tr>
<td>Probability</td>
<td>&gt; .05</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>&lt; 2.00</td>
</tr>
<tr>
<td>SRMSR</td>
<td>&lt; .08</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>PGFI</td>
<td>&gt; .60</td>
</tr>
<tr>
<td>TLI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CN: .05 / .01</td>
<td>&gt; 200</td>
</tr>
</tbody>
</table>

* = Items fall outside the criteria adopted in this study
4.10.2.5 The Overall Fit of the Model

As highlighted earlier, it has been widely recognised that there is considerable difficulty in assessing the goodness-of-fit of structural equation models (Hair et al., 2006; MacCallum & Austin, 2000; Mulaik, James, Van Alstine, Bennett, Lind & Stilwell, 1989). However, there are some aspects that need to be considered, including, absolute fit, incremental fit, and parsimonious fit measures (for all relevant fit measures see Table 4.10.11). This study made no attempt to validate one model over another, but rather aimed to identify an acceptable model. Thus, the measures of absolute fit and parsimonious fit in particular were fundamentally important. The absolute fit, incremental fit and parsimonious fit measures of the final model shall now be discussed in regards to acceptability of the final model (SEM 3).

4.10.2.5.1 Absolute Fit Measures

The chi-square value of 257.243 (231, p = .113) for the ML estimation indicated that there was an acceptable fit of the data to the model. However, it should be remembered that the chi-square is sensitive to sample sizes in excess of 200 (Hair et al., 2006), and so should be accepted with caution.

The CMIN/DF was 1.114 which is in the ideal range (less than 2 and as near to 1 as possible) and is often seen as a better predictor than the chi-square value (Byrne, 2001). The CMIN/DF has been within this ideal range throughout the development of the measurement and structural models.

The third measure of absolute fit used was the standardised RMSR. As stated earlier, the ideal SRMSR would be less than .08 so the result of .058 falls within the ideal range.

The RMSEA measure of .022 is well within the ideal range of less than .05. As discussed earlier this is particularly useful, due to the particular sensitivity to model misspecification, and tends to yield appropriate conclusions about model quality (Hu & Bentler, 1998; MacCallum & Austin, 2000). Thus the RMSEA supports the model
strongly. The RMSEA values have been low throughout the development of the measurement and structural models.

4.10.2.5.2 Incremental Fit Measures

The TLI (.968) and CFI (.973) both recorded very acceptable goodness-of-fit readings. It is generally recommended that a reading of .90 is an acceptable level of fit reading, however, readings above the .95 cut-off would represent a very good fit to the data. Thus, the TLI and CFI for this study support the model being a very good fit to the data. These statistics have been very acceptable throughout the development of the measurement and structural models.

4.10.2.5.3 Parsimonious Fit Measures

The PGFI, which provides a means of determining the extent to which overfitting of the data has occurred as a result of constraining too many parameters, was .710. This was an acceptable parsimonious reading for the model (> .60), which indicates acceptable fit.

The final index of the model which is taken into account is the CN ratio at the .05 and .01 level. The CN ratio specifically measures fit by referring to the sample size needed for the fit to be viewed as acceptable. With the results showing 249 and 264 respectively, the sample size shown here exceeds 200, thus, is a suitable fit.

4.10.2.6 Post-Hoc Model Fitting

These results show that the final model seems to be a very good fit to the data using the ML estimation and the sample (sample 1). With the conceptual underpinnings from research guiding the design of the model and the very acceptable fit statistics, the final model for this study has been accepted as appropriate. This was using the ML estimation and the first sample population. However, before discussing the
critical ratios (CR) and conclusions from the final model, final validations of the model were necessary. The first post-hoc validation of the model was to retest the model using the GLS estimation, rather than the ML estimation method used throughout the development of the measurement and structural models.

4.10.2.6.1 Fit of Model Using GLS Estimation

Once the final structural model was developed, it was retested using GLS estimation to see whether any differences would arise between the ML and GLS results. This was to check that the model was not overfitting, and that there were no abnormalities in the distribution of the data in the sample. This may have produced aberrant results with only using the ML estimation method. Thus, by also checking with GLS estimation, this can often discard these possibilities. Table 4.10.12 shows the Goodness-of-fit index results for the final model using GLS estimation method in comparison to the ML estimation method (see Appendix 39).

Table 4.10.12. Structural Model Three Statistics Using GLS Estimation

<table>
<thead>
<tr>
<th>Thesis Criteria</th>
<th>SEM 3 ML</th>
<th>SEM 3 GLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>257.243</td>
<td>241.281</td>
</tr>
<tr>
<td>df</td>
<td>231</td>
<td>231</td>
</tr>
<tr>
<td>Probability</td>
<td>&gt; .05</td>
<td>.113</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>&lt; 2.00</td>
<td>1.114</td>
</tr>
<tr>
<td>SRMSR</td>
<td>&lt; .08</td>
<td>.058</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt; .05</td>
<td>.022</td>
</tr>
<tr>
<td>PGFI</td>
<td>&gt; .60</td>
<td>.710</td>
</tr>
<tr>
<td>TLI</td>
<td>&gt; .90</td>
<td>.968</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt; .90</td>
<td>.973</td>
</tr>
<tr>
<td>CN: .05 / .01</td>
<td>&gt; 200</td>
<td>249 / 264</td>
</tr>
</tbody>
</table>

* = Items fall outside the criteria adopted in this study
The chi-square value of 241.281 (231, p = .308) for the GLS estimation also indicated that there was an acceptable fit of the data to the model. It showed a greater probability level than the ML estimation. The CMIN/DF was 1.045 which is in ideal range (less than 2 and as near to 1 as possible) and similar to that of the ML statistic. The standardised RMSR statistic was slightly higher at .063 than the ML reading (.058), thus being in the acceptable level for the current study which is < .08. The RMSEA measure of .014 is well within the ideal range of less than .05, and is a slightly better score than the ML reading of .022. The TLI (.958) and CFI (.965) both recorded very strong goodness-of-fit readings, similar to the ML estimation readings. The PGFI was .705 which was an acceptable parsimonious reading for the model (> .60), again, similar to the ML statistic. Finally, the CN statistic was 265/282, which was acceptable and similar to the ML statistic.

In regards to the comparison of the regression weight estimates between the ML and GLS estimation methods, with the exception of two, all critical ratios were analogous. However, two discrepancies exist between the ML and GLS estimations, which are the regression paths between ‘LD attitude’ and ‘LD strategies’, and ‘GTE’ and ‘LD Frustration’ (which can be seen in Appendices 38 and 39 respectively). Thus, these paths had significant critical ratios using the ML estimation, however, they had non-significant critical ratios in the GLS estimation. This resulted in the magnitude of these two paths being nearly double using ML estimation compared to the GLS estimation. All other regression weight scores were comparable (see appendices 38 and 39).

Overall, the GLS estimations were identical to the ML estimations, and all goodness-of-fit indices were significantly acceptable confirming that the final SEM was acceptable and a very good fit to the data.
4.10.2.6.2 A Cross-Validation Analysis Using Sample Two.

The second post-hoc validation of the model was to re-test the model using a second sample. As discussed in the previous chapter final models should be considered as a tentative solution due to re-specifications, which may be due to circumstances related to that specific data set (Hoyle, 1995). An approach for addressing this issue (post hoc model fitting), which involves re-testing the model with another sample set from the same population, has been suggested by Byrne (2001).

Thus, the second validation of the completed structural equation model three was to test the final model on the second sub-sample drawn from within the total sample. This was to make sure that the final model obtained was not merely peculiarly related to the specific data set (sample one). This was done, in the same way as sample one, using the maximum likelihood method. Table 4.10.13 shows the fit indices for the final model using sample two of the data set (see Appendix 40 for all statistical details of structural model three using sample two).

Table 4.10.13. Structural Model Three Statistics Sample Data Set Two

<table>
<thead>
<tr>
<th>Thesis Criteria</th>
<th>SEM 3 (Full Model)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2$</td>
<td>291.122</td>
</tr>
<tr>
<td>df</td>
<td>231</td>
</tr>
<tr>
<td>Probability</td>
<td>&gt; .05</td>
</tr>
<tr>
<td>CMIN/DF</td>
<td>&lt; 2.00</td>
</tr>
<tr>
<td>SRMSR</td>
<td>&lt; .08</td>
</tr>
<tr>
<td>RMSEA</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>PGFI</td>
<td>&gt; .60</td>
</tr>
<tr>
<td>TLI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CFI</td>
<td>&gt; .90</td>
</tr>
<tr>
<td>CN: .05 / .01</td>
<td>&gt; 200</td>
</tr>
</tbody>
</table>

* = Statistics fall outside the criteria adopted in this study
The chi-square value of 291.122 (231, p = .004) for sample two data showed a similar chi-square reading, although, the probability level was lower than the acceptable level (> .05). However, as discussed earlier, the chi-square was used mainly for hierarchical model development purposes. That is as each model was developed the chi-square statistic was used to test whether each change to the models made a significantly positive fit amendment to the model. Moreover, as highlighted earlier, the chi-square model fit criterion is sensitive to sample size because as sample size increases (generally above 200), the chi-square statistic has a tendency to indicate a significant probability (Schumacker & Lomax, 2004). This was the case with the samples in this study. Thus, the chi-square-probability was not deemed as important as a model fit criterion, and so the second sample reading of .004 has been viewed as insufficient grounds for rejection of the model. More importantly is the CMIN/DF statistic which was 1.260 which is in ideal range (less than 2 and as near to 1 as possible) and similar to that of sample one.

The standardised RMSR statistic was slightly higher at .064 than the sample one reading (.058), although, it is still within the acceptance level for the current study which is < .08.

The RMSEA measure of .033 is well within the ideal range of less than .05. The TLI (.925) and CFI (.937) both recorded acceptable goodness-of-fit readings, even though they were slightly lower than the sample one values. The PGFI was .701 which was an acceptable parsimony reading for the model (> .60), again, similar to the sample one statistic. Finally, the CN statistic was 220/234, which was acceptable.

Overall, the re-testing of the model on sample two revealed scores similar to those of sample one. Moreover, with the exception of the chi-square probability, all were quite acceptable, confirming that the final structural model was acceptable as it produced a reasonable fit to the second sample data.


4.11 EXAMINATION OF THE CRITICAL RATIOS

Having presented the model fit indices and the post-hoc model fitting validations, the results of the critical ratios of structural model three (using the ML estimation method and original sample one) shall now be discussed. The significance of the critical ratios (CR) for the regression weights was examined for the final model using the .05 significance level. Table 4.11.1 shows the critical ratios, significance, and standardised regression weight scores for each of the latent variable regressions in the model. As was discussed during the development of the structural equation models, those latent variable regressions that failed to be significantly different from zero (such as all of those that were connected to the ‘Diff Att’ latent variables) were deleted from the model during earlier analyses. At times it may be appropriate to retain regression paths with low critical ratios, where there are compelling theoretical reasons for doing so (Arbuckle, 1997). This process did not cause deletion of any paths that were essential from a theoretical perspective, thus, not affecting the model’s theoretical integrity. As a result, the final model incorporates only those latent variables that reached the significance levels.

Table 4.11.1. Critical Ratios of Final SEM

<table>
<thead>
<tr>
<th>Regression</th>
<th>CR</th>
<th>p</th>
<th>β</th>
</tr>
</thead>
<tbody>
<tr>
<td>LD Strat ← LD Att</td>
<td>3.105</td>
<td>.002</td>
<td>.275</td>
</tr>
<tr>
<td>LD Strat ← PTE</td>
<td>3.273</td>
<td>.001</td>
<td>.267</td>
</tr>
<tr>
<td>LD FeedFS ← PTE</td>
<td>3.223</td>
<td>.001</td>
<td>.214</td>
</tr>
<tr>
<td>LD FeedFS ← GTE</td>
<td>1.991</td>
<td>.046</td>
<td>.145</td>
</tr>
<tr>
<td>LD FrustFS ← GTE</td>
<td>-2.108</td>
<td>.035</td>
<td>-.150</td>
</tr>
<tr>
<td>LDSympFS ← LD Att</td>
<td>-2.918</td>
<td>.004</td>
<td>-.224</td>
</tr>
<tr>
<td>LD FailFS ← LD Att</td>
<td>-2.803</td>
<td>.005</td>
<td>-.202</td>
</tr>
<tr>
<td>LD FailFS ← PTE</td>
<td>-2.424</td>
<td>.015</td>
<td>-.157</td>
</tr>
</tbody>
</table>
The two significant CRs to the latent variable of instructional strategies used for students with LD were from ‘LD Att’ (CR = 3.105, p = .002) and ‘PTE’ (CR = 3.273, p = .001). These results suggest that the latent variables PTE and attitudes towards LD, significantly impact upon the higher cognitive level instructional strategies that preservice teachers would use in the classroom for students with LD. These latent variables are equally influential in their impact on the higher cognitive level instructional strategies. As discussed earlier in previous analyses, the attitude towards differentiation and GTE latent variables did not have a significant effect on the higher cognitive level instructional strategies that preservice teachers would use for students with LD.

This research shows that the more positive the preservice teacher’s attitude is toward students with LD, the more they would use the higher cognitive level instructional strategies with those students. Thus, the more negative the preservice teacher’s attitude is towards students with LD, the less likely were they to use the higher cognitive level instructional strategies with the students. Furthermore, the higher the preservice teachers’ personal teacher efficacious level, the greater is the likelihood of their intended use of higher cognitive level instructional strategies with the students. Thus the lower the preservice teachers’ personal teacher efficacious level is, the lower is the likelihood that they would employ the higher level instructional strategies with the students.

With regard to the critical ratios to attributional responses toward students with LD, it is worth noting that although they are significant, the amount of variance accounted for in each of the endogenous variables is relatively small. Thus, the results here may be statistically significant, however they are not substantial.
4.11.2.1 Feedback

The two significant CRs to the weighted composite measure ‘LDFeedFS’ (feedback response given to students with LD after a poor test performance) were from ‘PTE’ (CR = 3.223, p = .001) and ‘GTE’ (CR = 1.991, p = .046). Thus, these results suggest that the variables that significantly impact upon the feedback responses that preservice teachers give to students with LD are personal teacher efficacy and general teacher efficacy. Although both variables are influential in the feedback response given to students with LD, personal teacher efficacy is a greater significant influence than general teacher efficacy. This can be seen in the $\beta^2$ differences between personal teacher efficacy ($\beta^2 = .046$) and general teacher efficacy ($\beta^2 = .021$). As discussed earlier, the attitude towards students with LD and the attitude towards differentiation did not have a significant effect on the feedback response given to students with LD.

These findings show that the higher level of personal and general teacher efficacy, the more positive the feedback response is towards students with LD. Alternatively, the lower the personal and general teacher efficacy levels are, the more negative the feedback response is towards students with LD.

4.11.2.2 Frustration

The only significant regression path to the observed variable ‘LDFrustFS’ (frustration felt towards students with LD after a poor test performance) which was significantly different from zero was that from ‘GTE’ (CR = -2.108, p = .035, $\beta^2 = -.023$). Thus this research suggests that the variable that significantly impacts upon the frustration that preservice teachers felt in response to students with LD is general teacher efficacy. As discussed earlier, the attitude towards students with LD, attitude towards differentiation, and, personal teacher efficacy were not significant on the frustration felt towards students with LD.

This result shows that the higher the level of general teacher efficacy, the less frustrated preservice teachers feel towards students with LD. Conversely, the lower
the general teacher efficacy levels are, the more frustrated preservice teachers feel towards students with LD.

4.11.2.3 Sympathy

The only significant regression path to the observed variable ‘LDSympFS’ (sympathy felt towards students with LD after a poor test performance) which was significantly different from zero was that from ‘LD Attitude’ (CR = -2.918, p = .004, \( \beta^2 = -.050 \)). Thus this research suggests that the variable that significantly impacts upon the sympathy that preservice teachers felt in response to students with LD is their attitude towards students with LD. As discussed earlier, the attitude towards differentiation, personal teacher efficacy, and general teacher efficacy were not significant on the sympathy felt towards students with LD.

The results show that the more positive attitude preservice teachers have towards students with LD, the less sympathetic preservice teachers feel towards students with LD. Moreover, the more negative their attitude is towards students with LD, the more sympathetic preservice teachers feel towards students with LD.

4.11.2.4 Expectation of Future Failure

The two significant regression paths to the observed variable ‘LDFailFS’ (expectation of future failure of students with LD) which were significantly different from zero were that from ‘LD Attitude’ (CR = 2.803, p = .005) and ‘PTE’ (CR = 2.424, p = .015). Thus this result suggests that the constructs that significantly impact upon the expectation of future failure that preservice teachers have for students with LD are their attitude towards students with LD and their personal teacher efficacy. Both of these constructs are influential on preservice teachers’ expectation of future failure. However, preservice teachers’ attitudes towards students with LD play a slightly greater influential part that personal teacher efficacy. This can be seen in the \( \beta^2 \) differences between preservice teachers’ attitude towards students with LD (\( \beta^2 = -.041 \)) and personal teacher efficacy (\( \beta^2 = -.025 \)). As discussed earlier in previous
analyses, the attitude towards differentiation and general teacher efficacy variables were not significant on the expectation of future failure towards students with LD.

The results show that the more positive the preservice teacher’s attitude is towards students with LD, the lower the expectation of future failure for students with LD. Consequently, the lower the preservice teacher’s attitude is towards students with LD, the higher the expectation of future failure for students with LD. Also, the higher the preservice teacher’s personal teacher efficacious level is, the lower the expectation of future failure for students with LD. Thus the lower the preservice teacher’s personal teacher efficacious level is, the higher the expectation of future failure for students with LD.

Again, although these critical ratios to attributional responses towards students with LD are significant, the amount of variance accounted for in each of the endogenous variables is relatively small. Thus, the results here may be statistically significant, however they are not substantial.

**4.12 GROUP COMPARISON (INCLUSIVE EDUCATION)**

To examine whether any differences regarding structural equation model three occurred between preservice teachers who had and had not completed the compulsory inclusive education subject, a final re-test of the model was carried out. Structural equation model three (full model) was tested against preservice teachers who had completed (n = 201) and not completed (n = 271) the compulsory inclusive education subject to assess whether any differences occurred between the two groups. When re-testing the model to the two groups to compare any differences, of the 480 sample used in the previous SEM analyses (sample one and two), a further 8 needed to be removed from the analysis. This was due to information regarding the completion of the compulsory inclusive education subject missing. Thus, the total size of the sample used for this analysis of the structural model was 472.

Overall, with the exception of $\chi^2$, all goodness-of-fit indices had acceptable scores (see Appendix 41). However, although the goodness-of-fit was satisfactory, the
The purpose of this procedure was to identify differences in the pattern of relationships (i.e. covariances) in the two groups. There were some important differences between the resolution of the model of those preservice teachers that had completed the compulsory inclusive education subject, and those who had not completed the subject (see Appendix 41 for all statistical details of the inclusive education group comparisons of structural model three).

Table 4.12.1. Critical Ratios between Completion and non-Completion of the Compulsory Inclusive Education Subject.

<table>
<thead>
<tr>
<th></th>
<th>Completed Inclusive Ed.</th>
<th>Not Completed Inclusive Ed.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CR</td>
<td>p</td>
</tr>
<tr>
<td>LD Strat ← LD Att.</td>
<td>2.306</td>
<td>.021*</td>
</tr>
<tr>
<td>LD Strat ← PTE.</td>
<td>1.424</td>
<td>.154</td>
</tr>
<tr>
<td>LDFeedFS ← PTE.</td>
<td>.951</td>
<td>.342</td>
</tr>
<tr>
<td>LDFeedFS ← GTE.</td>
<td>1.398</td>
<td>.162</td>
</tr>
<tr>
<td>LDFrustFS ← GTE.</td>
<td>-2.245</td>
<td>.025*</td>
</tr>
<tr>
<td>LDSympFS ← LD Att.</td>
<td>-2.174</td>
<td>.030*</td>
</tr>
<tr>
<td>LDFailFS ← LD Att.</td>
<td>-1.840</td>
<td>.066</td>
</tr>
<tr>
<td>LDFailFS ← PTE.</td>
<td>-1.314</td>
<td>.189</td>
</tr>
</tbody>
</table>

* = Significant at the < .05 level.

The effect that preservice teachers’ attitudes towards students with LD, and personal teacher efficacy have on higher cognitive level instructional strategies that they would use for students with LD, differ due to the compulsory inclusive education subject. As Table 4.12.1 identifies, the effect of the inclusive education subject is to essentially reduce, or in the case of personal teacher efficacy, remove the effects of these two influences.
In regards to the attributional responses, feedback that preservice teachers give to students with LD is affected by the compulsory inclusive education subject in that it reduces the effect of personal teacher efficacy. However, the effect of general teacher efficacy remains relatively unchanged. The compulsory inclusive education subject enhances the effect of general teacher efficacy on the frustration that preservice teachers feel for students with LD, although still to a fairly low level. Similarly, the effects of the compulsory inclusive education subject are to enhance the influence of preservice teachers’ attitude towards students with LD concerning the sympathy felt towards them. Finally, the compulsory inclusive education subject has similar effects on the influence of both personal teacher efficacy and attitudes towards students with LD, when considering expectations of future failure for these students. That is, their influences are markedly reduced with the probability range of zero.

4.13 STRUCTURAL EQUATION MODEL SUMMARY

In this study the sequence of developing a structural equation model using AMOS has been followed from the beginning with creating and developing measurement models through to structural models. A hypothesised model was proposed initially and through development has been adapted and redeveloped to arrive at a preferred model. Each measurement model, involved in its development, was analysed and evaluated separately, prior to becoming part of the structural models. The final structural model (SEM three) has been shown that the sample statistics that were collected, fit the model, based on the model fit criteria selected for this study. It is recognised, though, that the final model is not the only possible model that might be accepted. Model fit is a subjective approach which requires substantive theory because there is no single best model for any particular context (Schumacker & Lomax, 2004).

Once the final model was accepted (after cross validating the model and comparing to alternative fit estimates and sample data) this section also discussed the findings of the critical ratios and correlations between the latent variables in the model. The following section will relate the results discussed in this section and previous sections within this chapter, and give a brief summary of the chapter.
This chapter has documented some significant differences between how preservice teachers respond to students with and without LD. It would seem from the results that preservice teachers, to some extent, are more positive, less frustrated, and more sympathetic towards students with LD (particularly towards those of a high ability who expend low effort), and also have a higher expectation of future failure compared to their NLD peers (particularly towards those of a high ability who expend high effort).

This chapter also identified some significant differences between a variety of strategies that preservice teachers would use for students with LD and those without LD. It would seem from the results that preservice teachers would use higher cognitive level instructional strategies to a far lesser extent on students with LD than students without LD.

It has also been reported that positive correlations exist between preservice teachers’ attitude towards students with LD, their attitude towards differentiating the curriculum, and general teacher efficacy. Moreover, it presented findings on differences between preservice teachers with high positive versus those with low negative attitudes and teacher efficacy levels in regarding how they react to attributional responses and the proposed use of instructional strategies.

Finally, the chapter presented findings from the structural equation model concerning how, and to what extent, attitude and teacher efficacy components influence preservice teachers’ attributional responses and instructional strategies.

The subsequent chapter will discuss these findings, firstly, by providing a general overview of the findings, and secondly, by conveying the findings in relation to the specific hypotheses proposed in section 3.2.1. The chapter will then highlight the limitations of the study, and discuss recommendations and implications for practice and future research. Finally, the chapter will conclude the study with some overall concluding comments from the research data.
CHAPTER 5 – DISCUSSION AND CONCLUSIONS

5.1 INTRODUCTION

This study aimed to explore and deepen the understanding of attributions, attitudes, teacher efficacy, and intended use of instructional strategies by preservice teachers with students with LD. Further, this study endeavoured to investigate possible relationships between these elements, and the potential influence that attitudes and teacher efficacy have in regards to attributional responses, and instructional strategies used in the classroom, with respect to students with LD.

This chapter discusses the findings of the study and the implications of these for students with LD and preparing future teachers. A general overview of each of the components of the survey instrument is presented as a starting point to discuss correlations and interactions among them. The chapter then provides a framework for the developed structural equation model within which the results can be considered. This is then followed by a concluding discussion of the results in relation to the hypotheses and questions that were initially formed at the beginning of the study, and later modified from the literature review. The limitations of the study are considered, after which the discussion turns to the recommendations and implications for future practice and research. Finally, the chapter concludes with some overall comments.
5.2 GENERAL OVERVIEW OF FINDINGS

5.2.1 Attributions

This study examined preservice teachers’ responses to student failure, considering students’ ability, effort, and LD status. As the focus of the vignettes was on failure rather than success, it is important to understand the respective roles of students’ effort (controllable) and ability (uncontrollable) in teachers’ attributions. To elaborate, if a student fails due to expending low effort, this can be seen as an understandable reason for failing (i.e. because it is a controllable cause). However, if a student fails while expending high effort, this cannot be seen as a valid reason for failing (thus, the cause must be due to other unknown reasons). Furthermore, if a student fails due to low ability, this can be seen as an understandable reason for failing (i.e. because it is an uncontrollable cause). However, if a student fails while having high ability, this cannot be seen as a valid reason for failing (thus, the cause must be due to other unknown reasons).

In section 5.2.1 graphs have been included to more clearly illustrate the difference between the preservice teachers’ responses (feedback, frustration, sympathy, and expectation of future failure) towards students with LD and to those without LD. Please note that the direction of each graph (i.e. what is on the left axis and the right axis) has been determined by the attributional dimensions of controllability or stability, with the controllable or stable causes on the left axis and the uncontrollable or unstable causes on the right axis.

Feedback: The results have shown that, overall, as students’ ability levels increased, the feedback given to students decreased. Thus, preservice teachers were more positive towards low ability students. Moreover, the greater the level of ability students had, the greater the difference in feedback given to students with and without LD. Thus, students with LD received more positive feedback than their NLD peers when students were of high ability (see Figure 5.2.1).
Furthermore, the results also show that, overall, the more effort expended by students, the greater the amount of feedback given to students. Thus, preservice teachers were more positive towards students who expended high effort. Additionally, the greater the effort that students expended, the smaller the difference in feedback given to students with and without LD. Thus, students with LD received more positive feedback than their NLD peers when students expended low effort (see Figure 5.2.2).
Consequently, in regards to attributional causes, the more uncontrollable the cause (low ability), the smaller was the influence of LD status. Conversely, the greater the students’ control of the cause (low effort), the higher was the influence of LD status. Thus, as the cause for failure becomes more controllable, the influence of LD status on feedback given becomes greater. On the other hand, as the cause for failure becomes less controllable (low ability) the influence of LD status on feedback given decreases.

**Frustration:** The results have shown that, overall, the frustration that preservice teachers felt towards students was dependent upon the controllable cause of effort expended, rather than the uncontrollable cause of ability level. The results show that the more effort expended by students, the less frustration felt by preservice teachers towards students. Thus, preservice teachers felt greater frustration with students who failed due to expending low effort. Moreover, the greater the effort expended by students, the greater the difference in frustration felt towards students with and without LD. Thus, students with LD elicited far less frustration than their NLD peers when low effort was expended (see Figure 5.2.3).

**Figure 5.2.3. Frustration (Effort)**
Consequently, in regards to attributional causes, the more controllable the cause of failure (low effort), the greater was the influence of LD status. Thus, as the cause for failure became more controllable, the influence of LD status on frustration became greater.

**Sympathy:** The findings show that, overall, as students’ ability levels decreased, the sympathy felt towards students increased.

**Figure 5.2.4. Sympathy (Ability)**

Thus, preservice teachers felt greater sympathy towards low ability students. Moreover, as the level of ability increased, the difference in sympathy felt towards students with and without LD increased. Thus, students with LD received more sympathy than their NLD peers, particularly when students were of a high ability (see Figure 5.2.4).

Furthermore, the results also show that, overall, the greater the effort expended by students, the more sympathy was felt by preservice teachers. Thus, preservice teachers were more sympathetic towards students who expended high effort. Additionally, the greater the effort students expended, the smaller was the difference in sympathy felt towards students with and without LD. Thus, students with LD received more sympathy than their NLD peers, particularly when students expended low effort (see Figure 5.2.5).
Consequently, in regards to attributional causes, the more uncontrollable the cause (low ability), the smaller was the influence of LD status. Conversely, the greater the control of the cause (low effort), the greater was the influence of LD status. Thus, as the cause for failure became more controllable, the influence of LD status, on sympathy felt, became greater. Additionally, as the cause for failure became less controllable, the influence of LD status on sympathy became smaller.

**Expectation of Future Failure:** The findings have shown that, overall, as students’ ability level decreased, expectations of future failure increased.

Thus, preservice teachers held higher expectations of future failure for students of lower ability. Moreover, the greater the level of ability of the students, the greater was the difference in expectation of future failure for students with and without LD. Thus, students with LD received greater expectation of future failure than their NLD peers when students were of a high ability (see Figure 5.2.6).
Furthermore, the results also demonstrate that overall, the greater the effort expended by students, the lower were the expectations of future failure. Thus, preservice teachers held higher expectations of future failure for students who expended low effort. Additionally, the greater the effort students expended, the greater was the difference in expectation of future failure for students with and without LD. Thus, students with LD elicited greater expectation of future failure than their NLD peers when students expended high effort (see Figure 5.2.7).
Due to the fact that LD status was more influential in higher levels of effort and ability (in contrast to feedback, frustration, and sympathy, in which LD status was more influential for higher levels of ability and lower levels of effort [see Figures 4.3.5a-d]) a further analysis was necessary to clarify the findings. Expectations of future failure related to the stability of the cause (unlike the previous three responses that relied on the controllability), with ability being a stable cause and effort being an unstable cause (Weiner & Kukla, 1970). However, Stevenson and Stigler (1992) found that this may not be the case concerning predicting teachers’ expectations of future performance of students. They found that, in Asian cultures particularly, teachers believed that effort expended was far more influential in influencing students’ future performances than ability. They found Asian beliefs to be that effort expended was the key to educational success. Yet in the USA, Stevenson and Stigler (1992) found a greater focus on ability as the cause for future success and failure.

Thus, two further multivariate analyses with repeated measures were carried out, using only LD students in one and only NLD students in the other. This was to determine whether any differences in expectations of future failure occurred between preservice teachers’ expectations for students with LD and without LD. Figure 5.2.8 presents the findings from these analyses. As the figure shows, the main influence in determining preservice teachers’ expectations of students without LD was effort. Thus, similar to Stevenson and Stigler’s findings of the beliefs in Asian cultures (1992), Australian preservice teachers believed that NLD students’ future successes and failures were determined primarily by effort expended. However, a particular point of interest related to the beliefs held for students with LD. As Figure 5.2.8 shows, the main influence in determining preservice teachers’ expectations of students with LD was ability. Thus, in contrast to their beliefs and expectations about students without LD, Australian preservice teachers believed that LD students’ future successes and failures were determined primarily by ability level.
Consequently, the results for attributional causes showed that the more stable the cause in regards to future expectations (low ability/low effort), the smaller was the influence of LD status.

### 5.2.1.1 Summary Discussion

In summary, it seems that LD does influence preservice teachers’ responses to students’ test failures. The work of Weiner and Kukla (1970) specified that responses towards students of high ability with LD who expended low effort, and failed a test, would be the same as their NLD peers, should LD not have any influence on teachers’ responses. However, as the results of this study have shown, when the cause for failure becomes more controllable, preservice teachers give greater positive feedback, are more sympathetic, and less frustrated towards students with LD than their NLD counterparts. In addition, the less stable the cause of failure, the greater was the expectation of future failure preservice teachers held for students with LD compared to their NLD peers. Thus preservice teachers saw LD as an uncontrollable, stable cause of failure. In all four responses (feedback, frustration, sympathy, and
expectation of future failure), a greater difference between high and low ability/effort students occurred within NLD students than within LD students. Low ability and low effort were clear causal explanations for the failure of NLD students. As for students with LD there was less difference between high and low ability/effort students. Thus, low ability and low effort were not always clear causes for the failure because LD was also a mediating influence. As Weiner (1986) highlighted, teachers’ response to students with LD can be seen as a ‘norm to be kind’ which is often felt towards those having limitations (such as those with LD). The greatest frustration, least sympathy, and most negative feedback were assigned to the high ability, low effort, NLD student (Phillip). Clearly, preservice teachers perceived this boy’s failures to be within his personal control and held him responsible. Conversely, the least frustration, greatest sympathy, and most positive feedback were given to the low ability, high effort, LD student (Andrew). It would seem that preservice teachers responded more positively to this student because the cause was seen to be out of his control (i.e. with two uncontrollable stable causes for failure to try to overcome through expending high effort).

Australian preservice teachers tend to respond to the failure of students without LD through what Jacobson, Lowery, and DuCette (1986) termed a ‘normal self-esteem attribution’. This is where failure is seen to be due to an external uncontrollable cause such as bad luck or internal controllable cause such as effort. Thus behavioural responses towards the students indirectly inform these students that expectations are high and that they have the potential to achieve in the future. However, as the findings of this study also show, Australian preservice teachers tend to respond to the failure of students with LD through what Waheeda and Grainger (2002) termed a ‘negative attribution style’. This is where failure is believed to be due to an internal and uncontrollable cause such as ability. Thus behavioural responses towards students indirectly inform the students that expectations are low and that they do not have the potential to achieve in the future. Sadly, this often reduces self-esteem, decreases motivation and creates a haven for future expectations of failure.

The conclusion regarding attributions supports previous research in that the attributional message that teachers and preservice teachers transmit to students with LD is that they are less competent than their peers without LD, and should expect to
achieve less as a result (Clark, 1997; Georgiou et al., 2002; Tollefson & Chen, 1988; Tournaki, 2003).

5.2.2 Attitudes

Overall, results show that female preservice teachers had a slightly higher positive attitude to students with LD and differentiation than males. The compulsory inclusive education subject overall, did play a significant part (although the significance was minimal). Preservice teachers who had completed the compulsory subject showed a more positive attitude towards students with LD and differentiating the curriculum for diverse learners than did preservice teachers who had not completed the compulsory subject.

From this, it can be concluded that preservice teachers with the most positive attitude towards students with LD and differentiation of the curriculum were females who had completed the compulsory subject. Consequently, those with the least positive attitude towards students with LD and differentiation of the curriculum were males who had not completed the compulsory subject. The compulsory inclusive education subject significantly impacted upon females' attitudes towards students with LD (although only minimally). Moreover, it significantly but only minimally influenced both males’ and females’ attitudes towards differentiation of the curriculum. This finding adds some support to Stella and colleagues’ (2007) findings in that special education subjects in the teacher training programs have a greater positive influence on female preservice teachers than they do on their male counterparts. As previous studies have shown, female preservice and in-service teachers are more positive to inclusion and students with special educational needs (Loreman et al., 2005; Romi & Leyser, 2006); have greater tolerance for implementing inclusive education (Avramidis et al., 2000; Avramidis & Norwich, 2002; Ellins & Porter, 2005); held higher teacher efficacious levels (Romi & Leyser, 2006); and, held higher levels of sympathy and lower levels of fear towards students with disabilities (Carroll et al., 2003). Thus, future research that particularly focuses on male preservice teachers’ attitudes, beliefs, and confidence in inclusive education is warranted. Moreover, evaluation of the differences between male and female preservice teachers in the area of the influence
of a special education subject in teacher training programs would be an interesting and valuable area for future research.

Of some concern is the fact that the amount of experience that preservice teachers had gained with students with LD did not influence their attitude towards students with LD. Nor did it have any significant influence on their attitude towards differentiation of the curriculum. The findings in this study contrasted with previous research, which concluded that the more experience teachers had with students with LD, the more positive was their attitude (Brooks, 2006; Brown et al., 2008; Hastings et al., 1996; Lambe & Bones, 2006; Sharma et al., 2006; Winter, 2006). However, in these studies the researchers’ terms of ‘experience’ referred to teaching experience, whereas in the present study experience with preservice teachers referred to their life experience, which may explain the discrepancy. Either way, it was hypothesised that the more exposure preservice teachers had to those with LD, the more positive would be their attitudes. The data reveals that this was not the case.

To some extent, the findings in this study support previous research that demonstrated that the more training undertaken by preservice teachers and the greater their knowledge of students with special educational needs, the more likely it was that there would be a decrease in negative attitudes and increase in positive attitudes (Avramidis et al., 2000; Ellis & Porter, 2005; Mungai & Thornburg, 2002). However, the study also provides some support for previous research in that preservice teachers’ training had only a small influence upon preservice teachers’ attitudes (Brown et al., 2008; Stella et al., 2007). Moreover, the findings from this study showed that in regards to attitudes towards students with LD, the compulsory inclusive education subject was significant only for females (not males).

The results also partly supported previous research which demonstrated that negative attitudes could lead to low expectations of students (Brooks, 2006; Campbell et al., 2003; Idol, 2006; Palmer, 2006). Positive attitudes, on the other hand, could lead to higher expectations of students (Angelidis, 2008; Westwood, 1995). This study found that preservice teachers with negative attitudes towards students with LD who expended low effort held significantly higher expectations of future failure towards students with LD than did preservice teachers with a more positive attitude. Thus,
those preservice teachers with a positive attitude towards students with LD may have seen low effort as the cause of failure rather than the student’s LD status. Conversely, those with a negative attitude towards LD students may have seen the LD status as the cause of failure rather than lack of effort.

The findings from this study have also shown that a correlation exists between preservice teachers’ attitudes and teacher efficacy (Brooks, 2006; Brownell & Pajares, 1999; Lambe & Bones, 2006; Palmer, 2006; Sharma et al., 2006; Winter, 2006; Woolfson et al., 2007). Moderate correlations between preservice teachers’ attitudes towards students with LD, differentiating the curriculum, and general teacher efficacy exist. That is, the more positive one’s attitude towards students with LD, and differentiating the curriculum, the higher was one’s general teacher efficacy. However, there was no correlation with personal teacher efficacy.

### 5.2.3 Teacher Efficacy

Similar to the pattern in the findings on attitudes, females had a higher general teacher efficacy level than males, and a slightly higher personal teacher efficacy level. The compulsory inclusive education subject did play a significant part in teacher efficacy. Those who had completed the compulsory subject had slightly higher general and personal teacher efficacy levels than those who had not yet completed the compulsory subject. These findings, to a certain extent, coincide with Bender and Ikechukwu’s (1989) findings that those who had completed compulsory inclusive education subjects had a higher teacher efficacy than those who had not completed the compulsory subject (although this, again, was only minimal).

From this, it could be concluded that preservice teachers with the highest general and personal teacher efficacious level were females who had completed the compulsory inclusive education subject. Consequently, preservice teachers with the lowest general and personal teacher efficacious level were males who had not yet completed the compulsory subject. Thus, the compulsory inclusive education subject only significantly impacted upon females’ personal teacher efficacy. The compulsory subject had no significant influence on males, nor did it have any significant influence.
on general teacher efficacy. Generally these findings reveal that the compulsory inclusive education subject had minimal influence on preservice teachers’ teacher efficacy. Moreover, the only minimal influence it had was on females’ personal teacher efficacy.

Perhaps the finding of the most concern was that the amount of experience that preservice teachers had with students with LD had no significant influence on their general or personal teacher efficacy levels.

### 5.2.4 Instructional Strategies

There is some controversy over which instructional strategies are most effective for students with LD, however, this issue was not within the scope of this study. Nevertheless, this study did focus on the comparison of instructional strategies deemed suitable for students with and without LD, and how this related to attitudes towards students with LD and teacher efficacy. Prior to discussing the findings from this study, however, a brief overview of instructional strategies and students with LD is necessary.

Over recent years, many teacher training institutions and researchers have favoured learner-centred (student-centred) approaches rather than teacher-centred (direct teaching) approaches (Gerges, 2001). This could be for a number of reasons, such as: the growing number of diverse students in a classroom (Brown, 2003); the belief it is no longer sufficient for teachers to teach content alone (Ellis, 2005b); learner-centred approaches are more effective than teacher-centred approaches (Almasi & Gambrell, 1994; Couzijn & Rijlaarsdam, 1996; Garcia-Sanchez & Fidalgo-Redondo, 2006; Sawyer, Graham & Harris, 1992); learner-centred approaches focus on students’ experiences, perspectives, backgrounds, talents, interests, capacities, and needs (McCombs, 1997); students need to learn how to learn and perform using strategies (Deshler & Lenz, 1989); and students achieve desired educational standards at higher levels and are more likely to develop to their full potential (McCombs & Whistler, 1997).
However, many practitioners may still view teacher-centred approaches as the most appropriate for some students, especially for those with LD (Ellis, 2005b). It is often assumed that mastery of basic skills is a prerequisite to acquisition of higher cognitive thinking skills (Ellis, 2002) and that remediation of basic skills should have a higher priority than instruction in thinking skills (Schlichter & Brown, 1985).

Conversely, many researchers not only favour teaching in a learner-centred environment, but many specifically favour teaching individual higher cognitive thinking approaches through a learner-centred environment (Davies, 2004). Higher cognitive thinking approaches have been defined as strategies that challenge “the student to interpret, analyse or manipulate information, because a question to be answered, or a problem to be solved cannot be resolved through the routine application of previously learned knowledge” (Newman, 1990, cited in Davies, 2004, p. 4).

Researchers have been tending to favour this approach because: failing to develop students’ higher cognitive thinking skills may lead to significant learning difficulties, even in primary years (Resnik, 1987, cited in Davies, 2004); students have the skills to persist more often at difficult or uninteresting academic tasks (Pintrich & De Groot, 1990); higher cognitive thinking approaches positively relate to self-efficacy (Bandura & Schunk, 1981; Pintrich & De Groot, 1990; Schunk, 1985); they also relate to increased classroom performances (Schunk, 1985); and, they foster understanding as opposed to factor memorisation (Perkins, 1994).

Learner-centred higher cognitive thinking approaches have also been favoured for students with LD because: rather than students with LD experiencing learning as assimilation of knowledge to be accomplished through routine activities, they would understand the need for ongoing solution monitoring (Bryson, 1993); students with LD respond enthusiastically to the approach (Graham & Harris, 1989); and, once students with LD have received these skills, they become privy to the best-kept secrets about how to achieve academic success, and they consequently use these skills in many contexts (Deshler, 2003; Gersten, 1998; Lerner & Kline, 2006; Mainzer, Deshler, Coleman, Kozleski & Rodriguez-Walling, 2003; Swanson, 1999).
Nevertheless students with LD often get a “watered down curriculum and low expectations by teachers” (Ellis, 2002, p. 2), and do not learn the necessary skills, thus rely on support. As Deshler and Lenz (1989) argue, the support students with LD receive, keeps them afloat in the content curriculum. However, they are not prepared to independently meet demands outside of the support system in the world of adulthood. Gerges (2001) found that the preservice teachers in the study, when on practicum experiences, abandoned learner-centred approaches for more teacher-centred approaches in order to gain control of the classrooms and ensure appropriate behaviour and learning. Gerges (2001) also concluded that in order to ensure high success rates for low-achieving students, the preservice teachers implemented direct instruction rather than promoted higher cognitive thinking approaches.

This study, therefore, governed by prior research, focused upon the higher cognitive level instructional strategies within a learner-centred environment, when analysing relationships with attitudes and teacher efficacy. It does not imply that these strategies are of the greatest significance for students with LD. Nevertheless, the research indicates that they significantly improve students’ academic achievements if addressed appropriately. This seems to be especially the case for students with LD.

The results from this study show that there were no significant gender differences in the intended use of instructional strategies for students with and without LD. Neither were there any significant differences in the intended use of instructional strategies between preservice teachers who had and had not completed the compulsory inclusive education subject. Thus, the compulsory inclusive education subject had no significant impact upon the instructional strategies that male and female preservice teachers reported they would implement for students with and without LD. Similar to findings previously reported in this study on attitude and teacher efficacy, the amount of experience that preservice teachers had with students with LD, had no significant influence on their reported use of instructional strategies.

Nevertheless, there were significant differences between the instructional strategies selected for students with and without LD. The higher cognitive level instructional strategies were reported more frequently for students without LD than they were for students with LD. This provides students with LD less opportunity to use, and learn
how to use, independent, higher cognitive learning strategies. Finally, the instructional
strategies intended to be used most frequently for students with LD were more
teacher-centred approaches, modelling and individual instruction. Thus, preservice
teachers reported they would use higher cognitive level instructional strategies within
a learner-centred environment far more frequently for students without LD.
Consequently, preservice teachers reported they would use more direct teacher-
centred instructional strategies for students with LD.

According to the research discussed earlier, this tends to contradict the instructional
strategies recommended for students with LD. According to Davies (2004) and Ellis
(2002), this is resulting in a watered-down curriculum for students with LD. Previous
studies reported that negative attitudes lead to low expectations of students with LD.
Similarly, the findings here also reveal that negative attitudes lead to less intended use
of the higher cognitive level instructional strategies. The results from this study reveal
that preservice teachers with a positive attitude towards students with LD reported
they would use higher cognitive level instructional strategies more frequently than did
those with a negative attitude. Moreover, higher-level thinking, problem solving, and
student-led discussion in particular, were the instructional strategies with the greatest
differences between those with positive and negative attitudes towards students with
LD. Thus, as preservice teachers’ attitudes towards students with LD became more
positive, their expectations of these students increased, and their reported use of
higher cognitive level instructional strategies became more frequent.

5.2.5 Structural Equation Modelling

Overall, the results of the structural equation model (which derived from the original
measurement models) showed that the higher cognitive level instructional strategies
that preservice teachers perceived they would use for students with LD were
influenced by their attitude towards LD and their own personal teacher efficacy level.
Thus, the outcome behaviour of preservice teachers was influenced, in part, by their
attitudinal and efficacious levels (although the critical ratios were low, they were
significant).
The results, therefore, partly support previous research which showed that teacher attitudes were correlated with their behaviours and actions towards students (Barco, 2007; Brooks, 2006; Idol, 2006; Knivetion, 2004; Palmer, 2006; Woolfson et al., 2007). The results also partly support previous research in that instructional strategies were influenced by teacher efficacy (Allinder, 1994; Davies, 2004; Romi & Leyser, 2006).

More specifically, prior to completing the compulsory inclusive education subject, preservice teachers’ attitude towards students with LD and their personal teacher efficacy level exerted a greater influence on their perceived use of higher cognitive level instructional strategies. Thus, once completed, only preservice teachers’ attitudes towards students with LD significantly influenced their perceived use of higher cognitive level instructional strategies (although this was less influential than prior to completing the subject).

Preservice teachers’ attributional responses towards students with LD were influenced by their attitudes towards students with LD, and their general and personal teacher efficacy levels. Interestingly, the influence that preservice teachers’ attitudes towards LD, and their personal and general teacher efficacy levels had on their attributional responses varied according to whether they had completed the compulsory inclusive education subject. Prior to completing the compulsory subject, teacher efficacy (general and personal) was more influential on their feedback response to students with LD; similarly, their attitudes towards students with LD and personal teacher efficacy were more influential on their expectations of future failure by students with LD. However, general teacher efficacy and attitudes towards students with LD had greater influence on preservice teachers’ feelings of frustration and sympathy for students with LD, after completing the compulsory subject.

Thus, prior to completing the compulsory inclusive education subject, attitude and teacher efficacy had greater influence on preservice teachers’ behavioural response to and expectations of students with LD. Furthermore, after completing the compulsory inclusive education subject, attitude and teacher efficacy were more influential on preservice teachers’ emotional feelings towards students with LD.
5.3 CONCLUSIONS ON HYPOTHESES

5.3.1 Hypothesis 1 Testing

The following hypothesis was proposed in section 3.2.1.

Hypothesis 1

‘Preservice teachers within Australia respond differently to students with and without LD. Preservice teachers:

a. will be more positive and less negative towards students with LD than students without LD;
b. will feel less frustration towards students with LD than students without LD;
c. will feel greater sympathy towards students with LD than students without LD; and,
d. will hold greater expectation of future failure for students with LD than students without LD.’

a. will be more positive and less negative towards students with LD than students without LD;

Preservice teachers in Australia generally expressed more positive and less negative feedback about students with LD. The only exception to this was related to students who were of a low ability and expended high effort. Students of low ability (uncontrollable reason for failure) who expended high effort (unknown reason for failure) received very similar amounts of feedback. Thus, LD and low ability can be seen as the same cause (uncontrollable). The greatest of differences, where students with LD received more positive and less negative feedback were those who expended low effort. Here, it could be suggested that low effort was the cause (controllable) of failure for NLD students, yet ‘LD’ was the cause (uncontrollable) for students with LD, thus, warranted more positive feedback.
b. will feel less frustration towards students with LD than students without LD

Preservice teachers felt less frustration towards students with LD than their NLD counterparts when students expended low effort. Thus preservice teachers may have viewed NLD students who expended low effort as failing due to a controllable cause and thus felt higher frustration than they did towards LD students, where they may have viewed ‘LD’ (uncontrollable cause) and not low effort as the reason for failure. Moreover, preservice teachers felt slightly more frustration towards students with LD than their NLD counterparts when students expended high effort. Thus, preservice teachers may have viewed NLD students who expended high effort as failing for unknown reasons, whereas students with LD may have been viewed as failing due to their ‘LD’ status.

c. will feel greater sympathy towards students with LD than students without LD

Sympathy felt towards students with LD was far greater than sympathy felt towards students without LD. In all of the comparisons between LD and NLD students, those with LD received greater sympathy. Similar to feedback given and frustration felt, the closest levels of sympathy felt for students with and without LD was towards those who were of low ability (uncontrollable cause) who expended high effort (unknown cause). Conversely, similar to feedback given and frustration felt, the greatest difference in the level of sympathy felt towards students with and without LD was towards those who were of high ability (unknown cause) who expended low effort (controllable cause), where far greater sympathy was felt towards students with LD. Thus, although the cause of failure by students without LD was seen as controllable (low effort), for students with LD, it could be suggested that it was once again the ‘LD’ (uncontrollable cause) that was the cause of the failure. Hence the discrepancy in levels of sympathy felt towards students.
Preservice teachers generally held greater expectation of future failure for students with LD than students without LD. The only exception to this was students who were of a low ability and expended low effort, as they received very similar expectations of future failure. As highlighted earlier, the main effect for academic expectations for students without LD was effort expended, whereas, for students with LD it was ability level. Thus, when ability level was low and effort expended was low, expectations for LD and NLD students to fail in the future were high. Conversely, the greatest difference in expectation occurred when students were of a high ability and expended high effort (as LD was an influencing cause for difference in expectation). As a result, preservice teachers held higher expectations of future failure for students with LD than students without LD.

The findings from this study confirm and support previous studies in that Australian preservice teachers respond to students with LD through what Waheeda and Grainger (2002) termed a ‘negative attribution style’. Similar to Clark’s (1997) findings of in-service primary teachers and Gray’s (2002) findings of in-service secondary teachers findings, the Australian preservice teachers would give greater positive feedback, be less frustrated and more sympathetic towards students with LD, and had greater expectations of future failure. Thus, in accordance with Weiner’s (1993) ‘sin versus sick’ dilemma LD is viewed as a sickness in which it is an uncontrollable, stable state. Moreover, failure for students with LD in the eyes of Australian preservice teachers view the reasons as uncontrollable and stable (Hastings et al., 1996; Tournaki, 2003) which warrant greater positive feedback, less frustration, and greater sympathy, yet also lower expectations. Thus, the conclusion to the hypothesis supports previous research in that the attributional message that teachers and preservice teachers transmit to students with LD is that they are less competent than their peers without LD, and should expect to achieve less as a result (Clark, 1997; Georgiour et al., 2002; Gray, 2002; Tollefson & Chen, 1988; Tournaki, 2003).
5.3.2 Hypothesis 2 Testing

The following hypothesis was proposed in section 3.2.1.

**Hypothesis 2**

‘Preservice teachers would use different instructional strategies at different frequencies for students with LD in comparison to students without LD.’

The results showed that preservice teachers would use different instructional strategies at different frequencies for students with LD compared to students without LD. Overall, for students without LD, all of the learner-centred instructional strategies were in the top half (ten) of the most frequent instructional strategies that preservice teachers would use. For students with LD, on the other hand, only three of the learner-centred instructional strategies were in the top half (ten) of the most frequent instructional strategies, and none of the higher cognitive level instructional strategies were in the top half. Thus, preservice teachers generally favoured teacher-centred instructional strategies for students with LD, and higher cognitive level learner-centred strategies for students without LD.

As Appendix 25 shows, all of the learner-centred instructional strategies were selected more frequently for students without LD than students with LD. The instructional strategies with the greatest differences in proposed usage for students with and without LD were all of the higher cognitive level instructional strategies within a learner-centred environment. These would be used far more frequently for students without LD. The only instructional strategies that preservice teachers would use more frequently for students with LD were direct teacher-centred strategies (individual instruction and modelling) and learning centres.

Thus, the findings from this study confirm the hypothesis and support the findings from previous research. Australian preservice teachers tend to favour the use of learner-centred (student-centred) approaches (Gerges, 2001) and in particular higher cognitive level instructional strategies (Davies, 2004) for students without LD.
However, in regards to students with LD, they tended to favour more direct teacher-centred instructional strategies (Ellis, 2005b), which according to Davies (2004) and Ellis (2002) results in a watered-down curriculum for the students. These findings also relate to Gerges’ (2001) study where preservice teachers favoured direct teacher-centred approaches for low-achieving students and in order to gain control of their classroom. Thus, the conclusion to the hypothesis supports previous research in that the instructional strategies with the greatest difference of perceived usage for students with and without LD were the higher cognitive level instructional strategies. These strategies were perceived to be used more for students without LD than they were for students with LD.

5.3.3 Hypothesis 3 Testing

The following hypothesis was proposed in section 3.2.1.

**Hypothesis 3**

‘Compulsory inclusive education subjects at tertiary institutions significantly influence preservice teachers’ attitudes towards students with LD and differentiation of the curriculum, teacher efficacy, and perceived use of instructional strategies for students with LD.’

The results were mixed concerning the impact that the compulsory inclusive education subject had on preservice teachers. As can be seen in Table 5.3.3, the compulsory inclusive education subject that preservice teachers complete during their training at tertiary institutions only has limited impact upon preservice teachers. Firstly, in relation to preservice teachers’ attitudes towards students with LD, the compulsory subject overall had a small positive significant impact upon preservice teachers. That is, once preservice teachers have completed the compulsory subject, their attitude towards students with LD becomes more positive. However, more specifically, it is amongst female preservice teachers that the significant positive impact occurs, as there were no significant differences for male preservice teachers.
Table 5.3.3. *Impact Inclusive Education Training has on Preservice Teachers*

<table>
<thead>
<tr>
<th></th>
<th>LD Attitude</th>
<th>Differentiation Attitude</th>
<th>General Teacher Efficacy</th>
<th>Personal Teacher Efficacy</th>
<th>Higher Cognitive Instructional Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
<td>NA</td>
</tr>
<tr>
<td>Males</td>
<td>NA</td>
<td>Positive</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Female</td>
<td>Positive</td>
<td>Positive</td>
<td>NA</td>
<td>Positive</td>
<td>NA</td>
</tr>
</tbody>
</table>

The compulsory inclusive education subject significantly impacted upon preservice teachers’ attitudes towards differentiating the curriculum for diverse learners. It positively impacted upon both male and female preservice teachers. However, greater significant impacts occurred amongst female preservice teachers.

While the compulsory inclusive education subject had a significant impact (although only minor) amongst preservice teachers’ general teacher efficacy, it was not significant specifically for male or female preservice teachers. In regards to personal teacher efficacy, the compulsory subject significantly impacted upon preservice teachers. However, similar to the impact on preservice teachers’ attitudes towards students with LD, it was only significant for female preservice teachers.

Finally the compulsory inclusive education subject did not significantly impact upon any of the preservice teachers’ reported frequency of use of higher cognitive level instructional strategies.

Overall, then, the compulsory inclusive education subject did have a significant impact on preservice teachers (Ellins & Porter, 2005). However, the impact was only minimal (Brown et al., 2008; Carroll et al., 2003; Stella et al., 2007). Furthermore, the compulsory inclusive education subject had more of an impact on female preservice teachers than male preservice teachers (Stella et al., 2007) in regards to attitudes towards students with LD, and personal teacher efficacy. The compulsory subject did not significantly affect preservice teachers’ general teacher efficacy or instructional strategies. However, the results show that these significances were minimal.
5.3.4 Hypothesis 4 Testing

The following hypothesis was proposed in section 3.2.1.

**Hypothesis 4**

*There is a positive correlation between a preservice teacher’s attitudes towards students with LD, attitudes towards differentiating the curriculum, and their teacher efficacious levels.*

Results show that, in part, there were significant correlations between preservice teachers’ attitudes towards LD, and their attitudes towards differentiation and general teacher efficacy. That is, the more positive preservice teachers’ attitudes were towards students with LD, the more positive was their attitude towards differentiating the curriculum. Also, the more positive preservice teachers’ attitudes were towards students with LD, the higher was their general teacher efficacy.

A significant positive correlation also existed between preservice teachers’ attitude towards differentiating the curriculum and general teacher efficacy. That is, the more positive preservice teachers’ attitudes were towards differentiating the curriculum, the higher was their general teacher efficacy. However, preservice teachers’ personal teacher efficacy was not significantly correlated to either of their attitudes, nor to general teacher efficacy.

The findings from this study partly confirm and support the hypothesis and previous studies in regards to the correlation between preservice teachers’ attitudes and teacher efficacy. The findings partly support previous research in that attitude and teacher efficacy have a major contributing relationship to one another (Brownell & Pajares, 1999; Jordan et al., 1997; Palmer, 2006; Sharma et al., 2006; VanReusen et al., 2000; Winter, 2006; Woolfson et al., 2007). That is, the more positive one’s attitude, the stronger their beliefs about their abilities to teach students. However, the findings from this study show that it is only the correlation of their attitudes (towards
differentiating the curriculum and students with LD) and general teacher efficacy that were significant. Thus, the conclusion to the hypothesis partially confirms that the more positive the attitude, the greater the teacher efficacy.

5.3.5 Hypothesis 5 Testing

The following hypothesis was proposed in section 3.2.1.

Hypothesis 5

‘Preservice teachers’ attitudes and teacher efficacious levels are predictive of their preferences for use of instructional strategies for students with LD.’

The final structural equation model (shown in Figure 4.10.11) shows that the predictors of perceived use of higher cognitive level instructional strategies were preservice teachers’ attitudes towards students with LD, and their personal teacher efficacy. Preservice teachers’ attitudes towards differentiating the curriculum and their general teacher efficacy did not predict the reported use of higher cognitive level instructional strategies for students with LD.

Furthermore, the results from earlier analysis (MANOVA) complement some of the findings from the structural equation modelling. The findings support the claims that preservice teachers’ attitude towards students with LD had a significantly positive correlation with the reported use of higher cognitive level instructional strategies for students with LD.

Preservice teachers’ attitudes towards students with LD and personal teacher efficacy had a significant positive correlation with the reported use of higher cognitive level instructional strategies for students with LD. That is, the more positive their attitudes were towards students with LD, the more frequently they reported they would use higher cognitive level instructional strategies. Alternatively, the more negative preservice teachers’ attitudes were towards students with LD, the less frequent was
their reported use of higher cognitive level instructional strategies. Additionally, the higher the level of personal teacher efficacy, the more frequently preservice teachers reported use of higher cognitive level instructional strategies. Alternatively, the lower the level of personal teacher efficacy, the less frequently they reported use of higher cognitive level instructional strategies.

The findings from this study partly confirm the hypothesis and previous research in that attitudes and teacher efficacy levels are predictive of their preferences for use of instructional strategies for students with LD. Thus, as Davies (2004) and Miller (2001) conclude those with the higher teacher efficacy level reported they would use more frequently higher cognitive level instructional strategies. Moreover, this study concluded that it was the personal teacher efficacy and not the general teacher efficacy that was partly predictive of this. Brooks (2006), Idol (2006), Palmer (2006), and Woolfson et al. (2007), claimed that teachers with positive attitudes can often produce greater opportunities, more challenging tasks, and heightened expectations of students in the classroom. The findings from this study support these claims to the extent that, in regards to Australian preservice teachers, the more positive their attitude is towards students with LD, the more opportunity students have in carrying out more challenging higher cognitive level strategies. Thus, the conclusion to the hypothesis partly supports previous research in that the personal teacher efficacy and attitude towards students with LD predicts the preferences for use of instructional strategies for students with LD.

5.3.6 Hypothesis 6 Testing

The following hypothesis was proposed in section 3.2.1.

Hypothesis 6

‘The responses that preservice teachers give students with LD (feedback, frustration, sympathy, and expectation of future failure) differ due to their attitudes and teacher efficacious levels towards students with LD.’
The findings related to this hypothesis were minimal but nonetheless significant. Thus, although the conclusions to the hypothesis are based on the significance of the results, they need to be taken with caution. The responses that preservice teachers gave to students with LD, in part, differed according to their attitude and teacher efficacious level.

**Feedback**

The final structural equation model (shown in Figure 4.10.11) shows that the predictors of the feedback response given by preservice teachers were their general and personal teacher efficacious levels. Preservice teachers’ attitudes (towards students with LD and differentiation) showed no significant contributions towards predicting and influencing the feedback given to students with LD. Moreover, the findings show that the higher the level of personal and general teacher efficacy, the more positive was the feedback response towards students with LD. Conversely, the lower the personal and general teacher efficacy levels were, the more negative was the feedback response towards students with LD.

**Frustration**

The final structural model (see Figure 4.10.11) also shows that the predictor of preservice teachers’ frustration for students with LD was general teacher efficacy. Preservice teachers’ attitudes and personal teacher efficacy did not predict the frustration felt towards students with LD. Moreover, the findings show that the higher their level of general teacher efficacy, the less frustrated they felt towards students with LD. Alternatively, the lower their level of general teacher efficacy, the greater frustration they felt.

Furthermore, the results from earlier analysis (MANOVA) complement part of the findings from the structural equation model. The findings supported the claims that preservice teachers’ general teacher efficacy had a significant correlation with the frustration felt towards students with LD. This was particularly the case for students with LD who expended high effort.
Sympathy

The findings from Figure 4.10.11 show that the predictor of preservice teachers’ sympathy for students with LD was their attitude towards these students. Preservice teachers’ attitude to differentiation and teacher efficacy did not predict the sympathy felt towards students with LD. Moreover, the findings show that the more positive the attitude towards students with LD, the less sympathetic they felt towards students with LD. Conversely, the more negative the attitude towards students with LD, the more sympathetic they felt towards these students.

Expectation of Future Failure

The final structural equation model indicated that the predictors of preservice teachers’ expectations of future failure were their attitudes towards students with LD, and their personal teacher efficacy level. Preservice teachers’ attitudes towards differentiation and general teacher efficacy did not predict their expectation of future failure. Moreover, the findings show that the higher and more positive their personal teacher efficacy and attitudes towards students with LD were, the lower was their expectation of future failure. Conversely, the lower and more negative their personal teacher efficacy and attitudes towards students with LD were, the higher was their expectation of future failure.

Furthermore, the results from earlier analysis (MANOVA) complement part of the findings from the structural equation model. The findings support the claim that preservice teachers’ attitudes towards students with LD had a significant correlation with the expectation of future failure. This was particularly the case for students with LD who expended low effort.

The findings from this study partly support the hypothesis. Although the findings to this hypothesis are significant, they are not substantial. As Australian preservice teachers’ attitudes and teacher efficacious levels increase, their feedback given to students with LD was more positive and their expectation of future failure was lower. This supports previous studies from Chester and Beaudin (1996), Davies (2004), Ross (1998), and, Tschannen-Moran (1998) who found that those with a high teacher
efficacy would give more critical praise and less negatively criticised feedback to students. Moreover, as Goddard et al., (2000); and, Miller (2001) found, those with high teacher efficacious levels held higher expectations of students.

In regards to attitudes the findings from this study support previous studies (Angelides, 2008; Brooks, 2006; Campbell et al., 2003; Idol, 2006; Palmer, 2006) which concluded that negative attitudes lead to low expectations, and positive attitudes lead to high expectations. Furthermore, the findings from this study also show that the higher the preservice teachers’ general teacher efficacious level, the less frustrated they felt, and the more positive their attitude towards students with LD, the less sympathetic they felt towards them. Although these findings show a significant relationship between attitude and teacher efficacy, and attribution theory, a previous attempt by Georgiou et al. (2002) found no significant relationship between teacher efficacy and attribution theory. However, in their study they did acknowledge a negative correlation between those who had a high teacher efficacy and anger (2002).

5.4 LIMITATIONS OF THE STUDY

Before examining the implications of these findings for practice and future research, and considering ways in which the findings of this study might be extended, there is value in considering the limitations of the current research. These limitations are concerned with the instrument used for collecting data, the administration of the instrument for collection of data, and the conceptual model developed.

In relation to the survey instrument, several limitations need to be considered. Firstly, the survey instrument used for collecting data came directly from various previous studies (for reasons discussed in the methodology chapter). Moreover, the measurements and style of the survey were not the same throughout. Thus, comparisons across the sections may have been hindered due to the different measurement scales and styles. For example, Part One used vignettes, whereas Part Two used five point Likert scale statements, and Part Three used six point Likert scale statements. Furthermore, the use of vignette scenarios may produce responses which
differ from the responses teachers would make in natural settings (Lee, Hallahan & Herzog, 1996). The responses preservice teachers make to such scenarios may be those they feel they would or should make given a similar situation rather than those they might actually make. However, the current study sought to advance research built on the foundation of methods similar to that employed in numerous studies involving attribution and achievement (Clark, 1997; Weiner & Kukla, 1970), as discussed in the methodology chapter.

Due to the survey instrument being administered across four university campuses at three different universities within New South Wales, it was not possible for the investigator to be present at all of the campuses to administer the instrument. Thus the conditions that existed at each of the campuses could have varied. However, since the nature of the instrument was not seen as threatening and may have been seen as serving a useful purpose, it might have motivated university lecturers to issue the survey to the targeted group of preservice teachers in a professional manner. Also, the investigator spoke with each university lecturer to discuss the protocols of the administration of the survey so that some form of consistency across the campuses occurred. It is thus reasonable to assume that the individual university lecturers would not have placed pressure or provided advice which may have led to bias in the preservice teachers’ responses. Furthermore, as the data were collected from the various campuses at the end of a lecture, the response rate was high. Nevertheless, only those who were in attendance at the lecture had the opportunity to complete the survey instrument. Thus, a small minority of preservice teachers across the campuses who did not attend the lecture did not complete the survey. This may or may not have influenced the findings of the current study.

In regards to the conceptual model developed through SEM, MacCallum and Austin (2000) warned that it is important not to overgeneralise the results from a single study. Limitations on the generalisability of the results from this study are mainly concerned with the gaps in the literature from which the conceptual model was developed. The study was complex and in relating the six measurement models — attitudes towards students with LD; attitudes towards differentiating the curriculum; general teacher efficacy; personal teacher efficacy; instructional strategies; and, attributional responses — the breadth of this study is unique. A number of other researchers have
investigated these components on an individual basis, and some have looked at
combining several of these together. However, none have attempted to consider them
all together in relation to students with LD.

It thus seems that there are a number of limitations on the extent to which these
findings might be utilised. With cognisance of these concerns, the discussion now
turns to the implications of the findings of the study for the professional preparation
of teachers, and for further research, where the issues raised by the present study
might be examined.

5.5 RECOMMENDATIONS AND RESEARCH IMPLICATIONS

5.5.1 Implications for Practice

These findings have practical implications for preservice teacher education,
professional preparation for others working with students with LD, and societal
issues. These not only reflect the theoretical implications but the broader translation of
these implications into classroom practice and the academic arena.

The current philosophical approach that preservice teachers hold in regards to
teaching students with LD focuses on an overemphasis of innate abilities (internal,
 uncontrollable and stable). A change of view is needed so that the focus is on effort
(internal, controllable and unstable). Success would then be attributed to internal traits
(positive attribution style) and failure due to external, uncontrollable, or internal,
controllable, and unstable traits (positive attribution style). They are also more likely
to consider and question the teaching of instructional strategies and classroom
environment if they adopt a positive attribution style approach, where failure is
considered to be external to the students, or controllable and unstable (rather than an
internal uncontrollable cause, such as lack of ability). This may then lead to attitudinal
changes that will help the student with LD achieve. Expectations would be higher as
external and internal controllable traits are considered to be open to change (unlike
internal, uncontrollable, stable traits such as ability). Therefore preservice teachers
may view students with LD in terms of their potential to learn, like they do with other students, rather than retaining a deficit view. Some ways in which this could be done will now be discussed.

Tertiary institutions need to consider addressing a broader knowledge base regarding students with LD and their capabilities. Separating learning disabilities from learning difficulties will give preservice teachers a greater opportunity to fully understand the implications of LD. LD is one of the categorised disabilities that generally do not receive special funding and specific support in the classroom for teachers (ALDA, 2002) in contrast to other disabilities within Australia. This may include having a teacher’s aide, a specialised consultant/teacher within the education system, specific technology and resources, and, working with specialised professionals outside of the school, to name but a few. Within the NSW DET, the term LD is not accepted (as discussed), but that of learning difficulties is. There are arguments as to whether the LD term should be used, or whether it should fit within the term of learning difficulties. One of the major criticisms of the NSW DET’s term and policies is that its major resistance to adopting the term learning disabilities is for budgetary concerns. One of the key benefits of adopting and using the term LD within DET policies, is that it would provide a means by which students with LD could access support. However, as AUSPELD stated:

> The learning difficulties-disabilities debate really has more to do with political issues, funding and service provision than it does with educational provision or accommodation. One of the big problems with calling it ‘learning disability’ is that if you assess the children and they exist you have to service them. The disability funding will then have to be divided into that many more sections. (New South Wales Parliament Legislative Council, 2002, p. 61)

Given this debate between LD and learning difficulties, it is not surprising that preservice teachers in Australia are confused and have lower expectations for students with LD, thus, misdiagnosing their potential. Moreover, in-service teachers are often isolated in the classroom, lacking support for meeting the needs of these students. Unless tertiary institutions prepare future teachers for meeting the needs and having more accurate perceptions, knowledge and expectations about students with LD,
students with this diagnosis may never have their potential fully recognised. By providing more comprehensive teacher training, the needs of students with LD could begin to be met. For example, the findings from this study have shown that the compulsory inclusive education subject only has a small influence on preservice teachers’ attitudes and teacher efficacy. Moreover, the compulsory subject is even less influential on males than females. Thus, tertiary institutions need to consider modifying their inclusive education subjects so that they have a greater influence on preservice teachers, and tailor the subject more towards male preservice teachers (as mentioned earlier, future research that focuses directly on the inclusive education subjects at tertiary institutions and the influences that they have on male and female preservice teachers would help guide tertiary institutions into doing this).

As previous research has shown, initial identification of students with LD is often left to the classroom teacher and to parents to raise awareness of possible students with LD. Currently it occurs through a ‘wait to fail’ approach where students with LD are often not identified until the age of eight due to the fact that educators wait until discrepancies appear between a student’s intelligence level and academic achievement level (Lyon, 1996). Preservice teachers tend to perceive students with LD as those who lack ability in comparison to others in the class, that is, they attribute LD to an internal, uncontrollable and stable cause and consider that they as teachers cannot do much to help these students achieve. This belief results from a deficit view of students with LD. They are thus more likely to use direct teacher-centred, and fewer higher cognitive level instructional strategies for those with LD, in comparison to others. The danger of this perception is that students with LD may respond and behave according to the expectations, as demonstrated by Rosenthal and Jacobson (1968), and later by Eccles and Wigfield (1985), who claimed the ‘Pygmalion effect’ and ‘Golem effect’ respectively. That is, if these future teachers believe that students are likely to fail in the future, due to lack of ability for example, then they will teach and behave towards the student in ways that will, more than likely, bring about future failure. One step towards redressing this situation is for tertiary institutions to better prepare future teachers with the skills, perceptions and knowledge to enable and teach students with LD.
Finally, tertiary institutions need a greater focus on instructional strategies and differentiating the curriculum for diverse learners in an inclusive classroom, particularly students with LD. For example, practicum considerations could be modified so that the emphasis of lesson evaluations provided by the cooperating teacher and university liaison officer also identifies the preservice teacher’s endeavour and effort at attempting more complex learner-centred instructional strategies, rather than on their overall seeming success or failure at implementation. This coupled with greater understanding and perceptions of students with LD, would better prepare future teachers.

The findings from this study reveal an obvious lack of information in relation to teacher training about LD in tertiary institutions, including accommodations that can be recommended for those with LD. However, the recommendations discussed here in regards to changes necessary in the tertiary institutions are only part of the solution as the problem about perceptions, understandings and expectations of those with LD is larger. As tertiary institutions are governed by the states’ DET, changes need to be made by policy makers and those within the DET across the states.

The policy makers, government, and DET across the states of Australia firstly need to address the concern of LD being defined and included as learning difficulty. Learning difficulty is an extremely broad term used in Australia, and covers many types of students from those with LD to those in poverty, and those with a moderate intellectual disability (Elkins, 2002). Thus, LD needs to be considered as its own identity so that greater awareness, perceptions and knowledge of these students can be achieved. This can only be done, however, if a nationally recognised and accepted definition of LD occurs. The current national and commonwealth legislations surrounding LD need to be better defined. LD is clearly identified currently under the Australian Commonwealth Disability Discrimination Act (1992) as “a disorder or malfunction which results in the person learning differently from a person without the disorder or malfunction (e.g. a person with autism or dyslexia)” (cited in ALDA, 2002, p. 5). If the states’ DET and government focused more on LD, preservice teacher training providers would more likely accommodate changes to the programs to increase awareness, perceptions and expectations towards students with LD.
We (Australia) need to promote the tools and skills for preservice teachers through training and practicum experiences as well as the transitional period from preservice to practicing teachers. This will enable preservice teachers to gain greater awareness and teacher efficacy beliefs about having the power to influence students’ learning and academic achievements. Such an ethos would promote a positive attribution style towards students with LD, supporting their belief in the positive attribution style and attaching success and failure towards it.

Having greater awareness, perceptions, understanding, and expectations of students with LD, will bring about more positive teacher behaviours and instructional strategies used towards these students. This in turn will prevent the ‘Golem effect’ from occurring and the creation of a more positive approach will focus more on effort, rather than ability. If so, it could be argued that students with LD are then more likely to be motivated by the expectation of succeeding, value of success, and thus, put forth the required effort (cost) towards the task at hand.

5.5.2 Implications for Future Research

The results from this research, and the previous discussion of the limitations of the research, have highlighted a number of issues which warrant further investigation. Future research might focus upon the range of data collection methods employed, and the groups examined in such studies. Further, such studies might additionally focus on the theoretical correlations and consider the evaluation of the model in different contexts. There needs to be a greater focus on Australia’s philosophical educational view of students in general, and in particular, on students with LD. This would add more evidence to whether educators form a deficit view that focuses on an overemphasis of innate abilities or effort, and whether there are contrasting views between students with and without LD.

As the findings from this study show that preservice teachers hold a negative attribution style towards students with LD, it could also be useful to replicate this study using university lecturers who instruct in education. The same use of vignettes on girls, as opposed to boys would be necessary to determine whether there are
different attributional responses for girls and boys. It would be necessary to add extra attributional causal beliefs in the vignette questions, as well as responses, so that clearer comparisons between attributions, and instructional strategies for students with LD can be explored.

Future research that focuses on gender differences in regards to attitudes towards students with LD would be necessary and valuable. Furthermore, future research that examines the influence of special education subjects within teacher training programs on male and female preservice teachers and possible reasons behind the differences would be critical. In regards to attitudes towards differentiating the curriculum, and teacher efficacy, future research could also look specifically at students with LD. Future research which measures attitude and teacher efficacy specifically towards students with LD (rather than just generally) may find stronger correlations and relationships with attributional responses towards students with LD, and instructional strategies used for students with LD.

The present study investigated the instructional strategies preservice teachers reported they would implement in the classroom for students with and without LD. However, it was not possible to further explore the scope and effectiveness of implementation. Consequently, additional research on strategies that are being used for students with LD compared to their peers would indeed be useful. Furthermore, future studies should also look at those strategies that preservice teachers report they would use in the classroom on practicum, and which strategies they do/are able to use within the classroom on practicum. These responses may differ, as preservice teachers believe they would use certain strategies having not yet tried them, but in reality may not have the skills/knowledge to apply them. Preservice teachers’ supervising teachers are influential here and may advise against, or even forbid the use of some strategies within their classroom.

Further research could also focus on the correlations between attitude towards students with LD and teacher efficacy towards students with LD in particular; and the influence that they have on attributional responses and instructional strategies (frequency, confidence, and effectiveness).
Moreover, throughout all of the proposed recommendations for future research mentioned above, these suggestions should focus on not only preservice teachers. Future research of a longitudinal nature, focusing on newly qualified teachers and practising teachers (primary, secondary, VET etc.) as they move through their teaching careers, would be useful. This would enable a closer look at the process of professional socialisation generally and also, in relation to special educational needs issues.

The present study was solely a quantitative study and collected a vast amount of data. The use of qualitative methods in collecting future data would also be valuable and would add richness to this data base. Further studies in Australia could compare teachers’ and preservice teachers’ perceptions and expectations of students with LD. As a final point, the future research studies discussed here could also be carried out cross-nationally to provide comparative data. Given the present government’s intention to establish educational consistency at a national level, such a study would be timely.

5.6 CONCLUSION

Perceptions, understandings, and expectations within Australia of those with LD, have raised issues over the years. The greatest difficulties have been in the search for how best to understand students with LD within the education system, to meet their needs and to teach them the necessary skills for adulthood. This study has removed many of the layers of complexity that have surrounded the issues of LD as well as the processes of teaching and learning. It is hoped that this knowledge will lead further research towards unfolding the many learning disability quandaries that still exist.

The interpersonal attributional traits that preservice teachers within Australia place on students with LD form a negative attribution cycle. This is where students fail through a lack of ability (LD) which is seen by the teacher as being stable, internal to and uncontrollable by the student, and thus, will not change over time. On the other hand, the interpersonal attributional traits that preservice teachers place on students without LD form a positive attribution cycle, where students fail through lack of effort which
is seen as internal to the student, controllable and unstable, thus can likely change over time. Preservice teachers appear to view students with LD more from a medical model viewpoint that emphasises deficits. They believe the causes are within the student and uncontrollable, rather than being due to external factors such as curriculum pedagogy.

The preservice teachers in this study had a philosophical educational view towards students without LD that was influenced by their beliefs about effort. That is to say, they gave primary attention to the influence of effort upon learning and held the belief that all students are able to achieve, if they are willing to put forth effort (even those categorised as low ability). In contrast, these preservice teachers had a philosophical educational view towards students with LD that was driven by their beliefs about the importance of ability/lack of ability. Consequently, they gave primary attention to the influence of innate ability (or lack of) on learning, creating the belief that students with LD who lacked ability were more likely to fail in the future, immaterial of the effort put forth.

Those who subscribe to the effort model are more likely to see errors as a natural part of the learning process. However, under the ability model, they are more likely to see errors as an indication of failure and conclude that the potential to learn is lacking (Stevenson & Stigler, 1992). Thus, those who subscribe to the effort model will have higher expectations of students, as the cause of achievement/fail is unstable and controllable, thus, hard work could lead to future success. Those, on the other hand, who subscribe to the ability model, will have lower expectations of students as the cause of achievement/fail is stable and uncontrollable, thus hard work will probably not impact upon future success. This implies that preservice teachers in Australia place an emphasis on ability, or lack thereof, towards students with LD. This, in turn, creates a low expectation of their future achievement, as it is unlikely to change over time.

This means that students with LD can be seen by preservice teachers as equivalent to low ability students. However, as emphasis on students without LD is on effort, rather than ability (which it is for LD), expectations, therefore, are higher towards NLD students than LD students who are of a low ability and expend high effort. Thus, NLD
students who expend high effort, result in the belief of future success. However, LD students who are of a low ability, result in future failures.

Emphasising innate ability in students with LD lowers expectations about what these students can accomplish through hard work. The beliefs that ability and LD are largely fixed can lead educators to be reluctant to demand higher levels of performance from students with LD. A misdiagnosis of these students’ potential, is likely to result in them completing their schooling with inadequate skills for adapting into adult society successfully. Teacher training institutions in Australia need to address the philosophies and assumptions that underlie the view of the child-as-learner that is presented to preservice teachers.

Preservice teachers who attribute the problems of a child with LD to innate characteristics of the student which are uncontrollable and stable, coupled with outside influences such as home and culture, are more likely to be reluctant to review teaching methods or to revise the curriculum content. This will create the perception that students with LD are beyond repair (having a low teacher efficacy). This, in turn, will help to create lower expectations from the preservice teachers and result in them using instructional strategies that give students substantially limited opportunities to succeed and achieve (Bamburg, 1994; Miller, 2001; Westwood, 2006).

Unfortunately, as this study has shown, preservice teachers within Australia, perceive students with LD as less sophisticated and as incapable of engaging in higher cognitive level instructional strategies. Thus the preservice teachers are likely to provide minimal opportunities for these students to practise them. Denying students with LD opportunities to engage in higher cognitive level instructional strategies can, according to Ellis (2002), severely reduce their chance of developing thinking skills. Students with LD receive more direct teacher-centred instructional strategies, and less learner-centred higher cognitive level instructional strategies than students without LD. This, Ellis (2002) argues, results in a watering down of the curriculum for students with LD.

The application of teacher efficacy to this study suggested that preservice teachers who believed, and were confident, in their own teaching abilities, were more likely to
have a greater academic focus on classroom instructional strategies and outcomes. This study found that it was preservice teachers’ confidence in their own teaching abilities (personal teacher efficacy) that mattered and not a general belief in the power of teaching (general teacher efficacy). Thus, preservice teachers who had a high personal teacher efficacy, and positive attitudes towards students with LD, were more likely to use higher cognitive level instructional strategies, having a greater belief in their ability to succeed.

Thus, the following key findings can be concluded from this study:

- Australian preservice teachers form a negative attribution cycle towards students with LD where failure through lack of ability results in having lower expectations of these students and their performances are unlikely to change. Students without LD are perceived through a positive attribution cycle where failure through lack of effort results in having higher expectations of these students for which their performances are likely to change.

- They see students with LD as less sophisticated and incapable of engaging in higher cognitive level tasks and propose to teach them through more direct teacher-centred instructional strategies. Students without LD on the other hand are seen as more sophisticated and capable of engaging in higher cognitive level tasks and preservice teachers propose to teach them through higher cognitive learner-centred instructional strategies.

- The less positive the preservice teachers’ attitude towards students with LD, the less frequently they would use learner-centred higher cognitive level instructional strategies when teaching them.

- The higher the preservice teachers’ personal teacher efficacious level, the more likely they are to incorporate learner-centred higher cognitive level instructional strategies when teaching them.
• A positive correlation exists between preservice teachers’ general teacher efficacy, and their attitude towards students with LD and differentiation of the curriculum. That is, the more they believe that they (as teachers) have the ability to influence students with their learning, the more positive is their attitude towards students with LD and differentiation of the curriculum.

• Inclusive education subjects within the tertiary institutions’ teacher training programs only marginally influence their attitudes and teacher efficacy. Moreover, they do not influence the perceived use of instructional strategies in the classroom. The limited influence of these courses impinged more upon females than males.

It is essential that preservice teachers be nurtured to fully understand students with LD and that many attributes and aptitudes of students with LD can be modified and enhanced by skilled teaching (Westwood, 2006). By providing better training of future teachers, the needs and opportunities within the academic arena of students with LD can begin to be met. Consequently, this study proposes that tertiary institutions need to train future teachers to identify and teach LD separately from learning difficulties (ALDA, 2002).

It is possible that people with LD have two forms of disability: the primary disability of the neurological disorder of LD, and the secondary disability being the perceptions, understandings, expectations and treatment from society towards those with LD. It is possible that the major problem for those with LD is not necessarily within the primary disability of actually having LD but with the secondary disability, that of social attitudes. The primary disability will never be eradicated, however, the secondary disability could and should change. Therefore, focused energy needs to be directed towards changing the secondary disability of LD within Australia, if those with LD are going to receive a greater quality of education and opportunity.

Moreover, as highlighted in the discussion of implications, this is not only the responsibility of tertiary institutions, but also the collective responsibility of the DET, government, and society. Therefore, even though the problem often stems from the
classroom, it is not only teachers who should take the blame. Little support and professional development is given to them once they have become practising teachers (Teacher Education Review, 2000), and as the study discussed, little training and knowledge transpires to them during their teacher training course.

This study has broadened and added to the research base on LD. The transformation of classrooms with inclusive and diverse classes, and the changing views of teaching all students and meeting everyone’s needs represent significant challenges. The development of programs for new teachers to address these emerging challenges in relation to students with LD is clearly central to the focus of this study. Preservice teachers’ perceptions, understandings and expectations of students with LD need to be guided carefully through their teacher training course and practicum experiences. The focus within Australia should be guided towards a philosophical educational view of students with LD, like that of other students, in that academic success is possible through effort, and that teachers play a major role in influencing students’ achievements. Thus, there needs to be higher expectations through an educational belief, not a medical belief, so that teachers can properly diagnose students’ potential to learn.

As a voice for the students would say, ‘don’t judge what I can do, by what you think I can’t do’ (Human Rights and Equal Opportunity Commission, 2003, p. 1).
REFERENCE LIST


281


