Factors Influencing Self-directed Learning
Readiness amongst Taiwanese Nursing Students

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STATEMENT OF ORIGINAL AUTHORSHIP

The work contained in this thesis has not been previously submitted to meet requirements for an award at this or any other higher education institution. To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made.

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Keywords

Self-directed learning (SDL)
Self-directed learning readiness
Approaches to learning
3P model of teaching and learning
Course Experience Questionnaire (CEQ)
Revised Two-factor Study Process Questionnaire (R-2F-SPQ)
Self-directed Learning Readiness Scale (SDLRS)
Mastery, Performance and Alienation Goal Scales
Abstract

Rapid scientific and technological advances in health care mean that nurses need to keep learning and engage in professional education so that they can continue to provide safe and quality care. Education programs which prepare nurses for practice as a registered nurse have a vital role to play in ensuring that graduates are self-directed in responding to the need for ongoing learning throughout their professional career. In many countries, improving students’ readiness for self-directed learning has thus gained increasing recognition as being an important goal of nursing education programs. This level of interest in developing self-directedness in learning is evident in many policy documents and research in Taiwan.

The aim of this study was to investigate factors influencing self-directed learning readiness amongst Taiwanese nursing students. A conceptual framework adopted from Biggs’s ‘3P model of teaching and learning’ was constructed to guide this study’s investigation. This study employed a two-staged mixed-method design to obtain a better understanding of Taiwanese students’ experience of SDL in undergraduate nursing programs.

Stage one of the present study was a qualitative approach using semi-structured interview to explore students’ experiences with learning activities which they perceived to be self-directed in their undergraduate programs. Eight students were interviewed. Findings from this stage reveal that participants perceived a shift in teaching and learning styles between their previous nursing programs and the university. The more frequent use of student-directed learning activities, in which students were encouraged to
be active and to take responsibility for their learning tasks, was one of the changes in teaching and learning approaches perceived by participants. Participants further suggested a number of factors that influenced the outcomes of these learning activities, including teacher-student interaction, facilitation process and learning resources.

Stage two of this study used a quantitative approach consisting of two phases: instrument pilot testing and a cross-sectional survey. In the first phase, the instruments were translated into Chinese through a rigorous translation process and tested with a convenience sample of nursing students in Taiwan. Results indicated the translated instruments were reliable and stable. The second phase, a cross-sectional survey, was conducted to examine the conceptual framework of this study. A total of 369 undergraduate nursing students completed the questionnaire. Results of data analysis provides support for the conceptual framework proposed for this study, suggesting that students’ achievement goals and their perceptions of the learning environment significantly influence their adoption of learning approaches and the development of SDL readiness.

Based on the results, this study provides practical implications that nurse educators may adopt to enhance students’ SDL readiness. This study also provides theoretical implications and recommendations for future research. It is envisaged that these recommendations may help future researchers focus their research design and further understandings of how to help students develop their ability to become self-directed learners.
# Table of Content

*Abstract* ................................................................................................................................. I  

*Table of Content* .................................................................................................................... III  

*List of Tables* .......................................................................................................................... VII  

*List of Figures* ........................................................................................................................... VIII  

*List of Appendices* ..................................................................................................................... IX  

**Chapter 1: Introduction** ....................................................................................................... 1  

1.1 Introduction ......................................................................................................................... 1  

1.2 Background .......................................................................................................................... 2  

1.2.1 Nursing education in Taiwan ......................................................................................... 2  

1.2.2 Contemporary issues in nursing education in Taiwan ..................................................... 4  

1.3 Need for This Study .......................................................................................................... 7  

1.4 Research Design and Methods ....................................................................................... 8  

1.4.1 Theoretical basis of this study ...................................................................................... 8  

1.4.2 Research purposes and design ..................................................................................... 11  

1.4.3 Significance of the study ............................................................................................. 12  

1.5 Overview of the Thesis .................................................................................................... 13  

**Chapter 2: Self-direction in Learning** .................................................................................. 15  

2.1 Introduction ....................................................................................................................... 15  

2.2 Definitions of SDL ............................................................................................................ 15  

2.3 Conceptualising SDL ....................................................................................................... 19  

2.3.1 Linear models .............................................................................................................. 19  

2.3.2 Interactive models ....................................................................................................... 20  

2.3.3 Instructional model ..................................................................................................... 21  

2.4 Facilitating Self-direction in Learning ........................................................................... 24  

2.5 Student Perceptions of SDL ........................................................................................... 27  

2.6 A Critique of SDL ............................................................................................................. 30  

2.6.1 Criticisms of the assumptions of SDL ......................................................................... 30  

2.6.2 SDL and Chinese learning culture .............................................................................. 31  

2.7 Summary ........................................................................................................................... 35  

**Chapter 3: Conceptual Framework** ..................................................................................... 37  

3.1 Introduction ....................................................................................................................... 37
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2 Theories of Student Approaches to Learning</td>
<td>38</td>
</tr>
<tr>
<td>3.3 Models of Student Learning</td>
<td>44</td>
</tr>
<tr>
<td>3.4 A Critique of Theories of Student Approaches to Learning</td>
<td>49</td>
</tr>
<tr>
<td>3.5 3P Model of Teaching and Learning</td>
<td>50</td>
</tr>
<tr>
<td>3.5.1 Presage factors</td>
<td>51</td>
</tr>
<tr>
<td>3.5.2 Process factors</td>
<td>52</td>
</tr>
<tr>
<td>3.5.3 Product factors</td>
<td>52</td>
</tr>
<tr>
<td>3.5.4 The interactive system of the 3P model</td>
<td>53</td>
</tr>
<tr>
<td>3.5.5 Previous research using the 3P Model</td>
<td>54</td>
</tr>
<tr>
<td>3.5.6 Adoption of the 3P model</td>
<td>60</td>
</tr>
<tr>
<td>3.6 Conceptual Framework for This Study</td>
<td>61</td>
</tr>
<tr>
<td>3.6.1 Presage factors</td>
<td>61</td>
</tr>
<tr>
<td>3.6.2 Process factor—learning approaches</td>
<td>70</td>
</tr>
<tr>
<td>3.6.3 Summary of the conceptual framework</td>
<td>71</td>
</tr>
<tr>
<td>3.7 Summary</td>
<td>72</td>
</tr>
<tr>
<td>Chapter 4: Methodology</td>
<td>74</td>
</tr>
<tr>
<td>4.1 Introduction</td>
<td>74</td>
</tr>
<tr>
<td>4.2 Research Design</td>
<td>74</td>
</tr>
<tr>
<td>4.2.1 Mixed-method approach</td>
<td>74</td>
</tr>
<tr>
<td>4.2.2 Research population</td>
<td>78</td>
</tr>
<tr>
<td>4.3 Stage One — Qualitative Approach</td>
<td>79</td>
</tr>
<tr>
<td>4.3.1 Aims of the study</td>
<td>79</td>
</tr>
<tr>
<td>4.3.2 Recruitment of participants</td>
<td>79</td>
</tr>
<tr>
<td>4.3.3 Semi-structured interview</td>
<td>81</td>
</tr>
<tr>
<td>4.3.4 Interview data analysis</td>
<td>83</td>
</tr>
<tr>
<td>4.3.5 Issues of translation</td>
<td>88</td>
</tr>
<tr>
<td>4.3.6 Trustworthiness of the findings</td>
<td>89</td>
</tr>
<tr>
<td>4.4 Stage Two — Quantitative Approach</td>
<td>93</td>
</tr>
<tr>
<td>4.4.1 Phase one – instrument pilot testing</td>
<td>93</td>
</tr>
<tr>
<td>4.4.2 Phase two – Cross-sectional survey</td>
<td>101</td>
</tr>
<tr>
<td>4.5 Ethical Considerations</td>
<td>108</td>
</tr>
<tr>
<td>4.6 Summary</td>
<td>110</td>
</tr>
</tbody>
</table>
Chapter 5: Stage One Study Results ................................................................. 111
  5.1 Introduction ............................................................................................. 111
  5.2 Experiences of Studying Nursing Programs........................................... 111
    5.2.1 A shift in teaching and learning styles .....................................................112
  5.3 Factors Influencing the Outcome of Student Perceived SDL Activities116
    5.3.1 Learning environment factors .................................................................117
    5.3.2 Motivation factors ....................................................................................142
  5.4 Perceived learning outcomes ................................................................. 147
    5.4.1 Improvement of generic skills .................................................................148
    5.4.2 A change of learning attitude .................................................................153
  5.5 Summary ..................................................................................................156

Chapter 6: Stage Two Study Results ............................................................... 158
  6.1 Introduction .............................................................................................158
  6.2 Results of Pilot Testing .............................................................................158
    6.2.1 Reliability tests .........................................................................................159
    6.2.2 Test-retest reliability ................................................................................160
  6.3 Descriptive Results of Survey .................................................................163
    6.3.1 Sample profile ...........................................................................................163
    6.3.2 Achievement goals and perceptions of the learning environment..........165
    6.3.3 Learning approaches and SDL readiness .................................................167
  6.4 Test of Assumptions ..................................................................................168
    6.4.1 Normality ..................................................................................................168
    6.4.2 Linearity and homoscedasticity .................................................................169
    6.4.3 Absence of multicollinearity .....................................................................170
  6.5 Associations between Students’ Background, Achievement Goals, Perceptions of the Learning Environment, Learning Approaches and SDL Readiness .................................................................172
  6.6 Factors Influencing SDL Readiness .......................................................175
  6.7 Factors Influencing Learning Approaches .............................................177
    6.7.1 Achievement goals, perceptions of the learning environment and deep approaches to learning .................................................................178
    6.7.2 Achievement goals, perceptions of the learning environment and surface approaches to learning .................................................................180
  6.8 The Mediating Effect of Approaches to Learning ....................................181
6.8.1 Approaches to learning and SDL readiness .....................................................182
6.8.2 Mediating effect of learning approaches on the relationship between achievement goals and SDL readiness.................................................................183
6.8.3 Mediating effect of approaches to learning on the relationship between perceptions of the learning environment and SDL readiness.....................................185

6.9 Summary ...................................................................................................187

Chapter 7: Discussion and Conclusion ....................................................189

7.1 Introduction ..............................................................................................189
7.2 Summary of the Study ..............................................................................189
7.3 Major Findings ............................................................................................191

7.3.1 SDL experiences of undergraduate nursing students in Taiwan.....................191
7.3.2 Achievement goals, perceptions of the learning environment, learning approaches and SDL readiness of Taiwanese nursing students...............................196
7.3.3 Relationships between achievement goals, learning approaches and SDL readiness .................................................................................................................200
7.3.4 Relationships between perceptions of the learning environment, learning approaches and SDL readiness .................................................................203
7.3.5 Relationships between approaches to learning and SDL readiness ...................206
7.3.6 Mediating role of deep approaches to learning ................................................206

7.4 Implications ...............................................................................................208

7.4.1 Theoretical implications ...............................................................................208
7.4.2 Practical implications ....................................................................................210

7.5 Limitations and Recommendations to Future Research .......................214

7.6 Conclusion .................................................................................................218

References ..................................................................................................220

Appendices ......................................................................................................i
List of Tables

Table 3.1: Study orientation and characteristic elements (Entwistle & Ramsden, 1983) ....40
Table 3.2: The motives and strategies of student approaches to learning (Biggs, 1987).....41
Table 3.3: Comparison of previous research undertaken on the 3P model of teaching and learning.................................................................56
Table 4.4: Interview questions for the stage one study.........................................................82
Table 4.5: An example of a coding system for the first concept: Experiences of studying in nursing programs (codes, sub-categories, categories and theme from data analysis).............87
Table 4.6: Methods for checking trustworthiness in qualitative research.........................90
Table 5.7: Theme and categories of students’ experiences of studying nursing programs. 112
Table 5.8: Themes and categories relating to students’ perceptions of factors influencing the process and outcome of SDL activities.................................................................117
Table 5.9: Themes and categories of students’ perceived learning outcomes of SDL activities .................................................................................................................................148
Table 6.10: Results of internal consistency of scales ..............................................................160
Table 6.11: Results of test-retest ..........................................................................................161
Table 6.12: Demographic background of participants..........................................................165
Table 6.13: Descriptive statistics for students’ achievement goals and perceptions of the learning environment .........................................................................................167
Table 6.14: Descriptive statistics for students’ approaches to learning and SDL readiness .................................................................................................168
Table 6.15: Correlation between continuous independent variables .................................171
Table 6.16: Association between programs, learning approach and SDL readiness .........172
Table 6.17: Association between achievement goals, learning environment, learning approaches and SDL readiness .................................................................174
Table 6.18: Hierarchical regression test for SDL Readiness...............................................177
Table 6.19: Hierarchical regression test for Deep Approach to learning ............................179
Table 6.20: Hierarchical regression test for Surface Approach to learning......................181
Table 6.21: Regression test for relationship between learning approaches and SDL readiness .................................................................................................183
List of Figures

Figure 1.1: Nursing education system in Taiwan ................................................................. 3
Figure 1.2: Stages one and two of this study ................................................................. 12
Figure 3.3: Model of teaching and learning (Entwistle, 1987) .................................. 45
Figure 3.4: Model of student learning in context (Ramsden, 2003) ......................... 46
Figure 3.5: 3P model of teaching and learning (Biggs, 2003) .................................. 48
Figure 3.6: Conceptual framework for this study (Adopted from Biggs, 2003) .... 61
Figure 4.7: Interview participants’ nursing education background .................. 80
Figure 4.8: Paths of mediating effect ........................................................................ 108
Figure 6.9: Bland-Altman plot of Goal Scales ............................................................ 162
Figure 6.10: Bland-Altman plot of CEQ ................................................................. 162
Figure 6.11: Bland-Altman plot of R-SPQ-2F ............................................................ 163
Figure 6.12: Bland-Altman plot of SDLR ................................................................. 163
Figure 6.13: Histogram of SDLRS scores ................................................................. 169
Figure 6.14: Normal probability plot of SDLRS scores ........................................ 169
Figure 6.15: Residual plot of SDLRS scores with Good Teaching scores .......... 170
Figure 6.16: Mediating effect of Deep Approach between mastery goal and SDL readiness .................................................................................................................................. 185
Figure 6.17: Mediating effect of Deep Approach between perceptions of the learning environment and SDL readiness ....................................................................................... 186
List of Appendices

Appendix 4.1: Ethic approval from QUT and nursing departments in Taiwan ..................... i
Appendix 4.2: Interview information sheet and consent form.................................................. v
Appendix 4.3: Conference acceptance letter and abstract.................................................... viii
Appendix 4.4: Permissions to use questionnaires .................................................................... xi
Appendix 4.5: Comparison of translated and back translated instruments ............................. xvi
Appendix 4.6: Survey questionnaire and covering letter......................................................... xxxii
Chapter 1: Introduction

1.1 Introduction

Rapid changes in health care means that the knowledge that nursing students learn at school can quickly become obsolete when they join the workforce. Nursing graduates today are likely to work in a range of different conditions and contexts during their professional careers. Nurses thus need to keep learning and engage in continuing education, to ensure they maintain professional competence (Freda, 1998; Thorne, 2006). Nursing education has a vital role to play in ensuring that graduates can adapt and respond to this need for continuous learning in their professional careers (Nolan & Nolan, 1997a; Thorne, 2006).

A key element believed to be important for university graduates to engage in continuous learning is their ability to be self-directed in learning (Canipe & Brockett, 2003; Patterson, Crooks, & Lunyk-Child, 2002). Self-directed learners are often described as being autonomous in and positive towards learning (Candy, 1991; Guglielmino, 1977; Knowles, 1975). In addition, they are described as being able to plan, manage and evaluate their own learning (Candy, 1991; Fisher, King, & Tague, 2001). These self-directed learning (SDL) abilities are thought to encourage individuals to continue using their personal competencies and outside resources to educate themselves (Areglado, Bradley, & Lane, 1996; Candy, 1991; Guglielmino, 1977; Knowles, 1980). Improving students’ ability to be self-directed in learning has thus become accepted by many as an important goal of higher education (O'Shea, 2003; Patterson et al., 2002; Wilcox, 1996).
In Taiwan, encouraging nursing students to become self-directed learners is highlighted as an important educational goal (Lin & Chen, 2007; Lu, 2004). The Ministry of Education (MOE) advocates that the goals of undergraduate programs in technological and vocational education are to cultivate professional skills, management skills, and abilities of continuous learning (Curriculum Research and Development Centre, 2003). In particular, the MOE notes that graduates of nursing and allied health programs are expected to be self-directed in acquiring professional knowledge and familiarity with new techniques to provide competent health care (CRDC, 2003).

This thesis is concerned with understanding influences on nursing students’ development of self-direction in learning. To establish the context for the research conducted for this study, the current nursing education system and issues facing nursing education in Taiwan are introduced in Section 1.2 of this chapter. The second part of the chapter (Section 1.3) outlines the need for this study. The research design and methods are briefly described in Section 1.4 of this chapter. An overview of the content of this thesis is presented at the end of this chapter.

1.2 Background

1.2.1 Nursing education in Taiwan

Students in Taiwan are required to complete a 9-year education which includes six years of elementary school and three years of junior high school. After graduating from junior high school, students can choose to enter high school, 5-year junior college or vocational high school. For students who would like to become nursing professionals, two education systems offer
nursing programs: the general education system and the technological and vocational education (TVE) system (see Figure 1.1).

Figure 1.1: Nursing education system in Taiwan

In the general education system, students can enter senior high school and study a 4-year undergraduate nursing program in universities. In the TVE system, there are three levels of nursing programs. Vocational high school provides a 3-year nursing course which, previously, students entered from junior high school. Due to recent educational reform, this program ceased recruiting in 2005. Junior nursing college includes a 5-year program and a 2-year program. The 5-year program recruits students from junior high school, while the 2-year program takes graduates of vocational high school (soon to cease). Graduates of junior nursing college are awarded an
associate nursing degree. Undergraduate nursing programs include a 2-year program which recruit graduates of junior nursing colleges, and a 4-year program for graduates from vocational high school (and will soon recruit graduates from senior high school). Students who complete the undergraduate program are awarded a Bachelor of Science (in nursing) degree.

1.2.2 Contemporary issues in nursing education in Taiwan

Recent educational reform in Taiwan aimed to improve the quality of education in the TVE system. This reform has resulted in the upgrade of many vocational high schools to nursing colleges, and nursing colleges to university faculties or departments. In 1994, there were only 11 universities operating undergraduate nursing programs. This had increased to 21 in 2000 (Lee, Chen, & Chen, 2001). Such rapid reform has resulted in many more nurses obtaining higher educational qualifications than was previously the case. Soon all nurses will hold at least an associate nursing degree, with increasing opportunities for them to obtain a bachelors degree through the TVE system (Chung, 2004). These changes have led some authors to raise concerns about the quality of higher education in the TVE nursing programs (Chung, 2004; Lu, 2004).

A report entitled ‘Course Plan in Allied Health Education’ prepared by the Curriculum Research and Development Centre (2003) in Taiwan emphasised that the educational goals of undergraduate programs should be focused on developing students’ professional skills, management skills and aptitude for continuous learning. This report also suggested that these desired educational goals can be achieved when university teaching is
student-centred and when teachers are able to facilitate students’ independence, objective judgement and self-direction in learning. While this report documents some important principles to guide nursing education, it does not contain detailed guidance as to how such outcomes can be achieved or what factors influence achievement of these goals.

In line with the emphasis of facilitating students’ self-direction in learning suggested in the CRDC report, the literature reflects an increasing interest amongst nurse educators in Taiwan in using active teaching and learning strategies to improve students’ self-direction in learning (Chien & Huang, 2006; Lee-Hsieh, 2003; Lee-Hsieh, Kao, Kuo, & Tseng, 2003). For example, Kuo and her associates (2000) developed a learning module for perinatal nursing aimed at encouraging students to become more self-directed in learning. The content of this module was delivered in part by video tapes and computer-assisted instruction for both theory and practical skills components. After the teaching sessions, students were encouraged to use the computer-assisted program to reinforce what had been taught and to practise nursing techniques in their own time. Kuo and her associates (2000) reported that the teachers and students who participated in the project generally gave positive feedback about this form of teaching and learning assistance. However, details of the program and evaluation of students’ self-direction in learning was not described.

More recently, Tseng and colleagues (2006), interested in problem-based learning (PBL), designed and implemented a problem-based subject, then compared control and experimental groups to evaluate differences in students’ ability to think critically and to be self-directed in learning. This
subject (Symposium Regarding Clinical Cases) required students in the experimental group to analyse two to three clinical scenarios during a semester (16 weeks). With teachers as facilitators, students were encouraged to determine their learning goals, discuss problems with team members and use critical thinking strategies and problem-solving skills to complete reports. Results suggested that students who participated in this PBL subject reported significantly higher scores on their SDL ability and critical thinking than those in the control group.

The research described above suggests that SDL concepts are attracting the interest of nurse educators in Taiwan. These studies provide examples of how nurse educators have included learning activities that are partially directed by students (e.g., computer-assisted learning modules and group discussions) to encourage students to become active in learning. However, it is not well described and understood in these studies whether such activities result in students being more self-directed in their learning. In Kuo and associates’ (2000) study, the learning module was used to assist teaching rather than to encourage students to take responsibility for directing their own learning. Student self-direction in learning as an outcome of such teaching and learning strategies was not been examined in detail in this study. Tseng and her colleagues (2006) used a six-item scale measuring students’ SDL ability, however, the validity and reliability of this instrument was not tested and the application of the results may therefore be limited. While nurse educators in Taiwan appear to have given increasing attention to using student-directed and active learning strategies as part of their nursing curricula, the extent to which such efforts have resulted in graduates who are more self-directed in their learning has not been examined.
1.3 Need for This Study

There are a number of reasons why nurse educators in Taiwan may face particular difficulties when introducing active learning strategies to improve their students’ ability to be self-directed learners. It has been suggested that nurse educators in Taiwan have limited training in education theories and strategies (Chung, 2004; Lu, 2004), thus limiting nurse educators’ ability to use student-centred teaching strategies and to motivate students towards self-directed in learning (Chung, 2004). In addition, some writers have suggested that students in Taiwan may be more passive in learning than students who come from other cultural contexts (Chan, 1999; Watkins & Biggs, 2001). As such, some writers have argued that Taiwanese students may prefer teacher-centred ‘sit-and-listen’ methods, resulting in resistance to participation in self-directed activities (Chan, 1999; Watkins & Biggs, 2001).

While these arguments require further critique, it is acknowledged that cultural contexts may be an important influence on learning. As such, studies which examine the application and outcomes of different learning approaches in different cultural contexts are necessary. Moreover, while noted to be important, neither government reports nor the available published research articles have provided practical suggestions about how to achieve the educational goal of facilitating students’ self-direction in learning. Research investigating how Taiwanese nursing students perceive the learning activities introduced to encourage their self-direction in learning in the undergraduate program, and what factors influence their development of self-direction in learning is needed.
This study is guided by two needs: the need to understand Taiwanese nursing students’ experiences of learning activities that have the potential to develop self-direction in learning in their current undergraduate programs; and the need to identify factors that affect such development. The investigation that forms the foundation of this thesis is based on the voices of nursing students. As Ramsden (2003) said:

_We can only improve the quality of education if we study its effects on students and look at the experience through their eyes_  
_(p.18)._  

### 1.4 Research Design and Methods

#### 1.4.1 Theoretical basis of this study

The concept of SDL has been broadly discussed and applied in a range of educational contexts. Some writers have defined SDL as a learning process involving a series of inter-related activities, such as identifying learning needs; deciding learning goals; pursuing learning strategies; and evaluating learning outcomes (Iwasiw, 1987; Knowles, 1975). Others have argued that the essence of SDL should be placed on the characteristics that make a learner self-directed, that is, the learners’ ability and willingness to take control of their own learning (Brockett & Hiemstra, 1991; Candy, 1991; Guglielmino, 1977; Knowles, 1980).

Many authors have further noted that these characteristics (i.e., learner’s ability and willingness) of being self-directed can be facilitated by introducing appropriate learning activities (Candy, 1991; Grow, 1991;
Chapter 1

Knowles, 1980). That is, it can be seen as an outcome of the learning process. Candy (1991), for example, suggested that in formal education settings, the implementation of learning activities which allows a balance of control between students and the teacher is thought to encourage the development of students’ autonomy and capability to manage their own learning. Grow (1991) proposed that activities involving student-direction, either partially or totally, may assist students to become more self-directed in learning. As such, encouraging students to undertake active learning activities (i.e., group projects, student seminars, or independent studies) are thought to help their development of self-direction in learning (Gibbons, 1994; Grow, 1991; Stubblefield, 1981).

Empirical nursing studies investigating how to improve student self-direction in learning have focused on the effectiveness of various teaching approaches (Chung, Kao, & Wu, 1999; Clark, 1990; Kang, 2002; Tseng et al., 2006; Wiley, 1983; Williams, 2002). In these studies, learning activities and programs, such as learning contracts, student SDL modules or PBL programs, were implemented with nursing student samples. Results of these studies varied, with some suggesting the activities were effective in improving student self-direction in learning (Chung et al., 1999; Kang, 2002; Tseng et al., 2006), while others were not (Clark, 1990; Wiley, 1983; Williams, 2002).

Some researchers have therefore argued that many factors need to be considered other than the mere implementation of learning activities. For example, they suggested that students’ opportunities for being independent in the learning tasks (Alspach, 1991; Williams, 2002), facilitating methods
(Kang, 2002) and assessment methods (Clark, 1990) may be influential to student self-direction in learning. Indeed, SDL writers have argued that the development of student self-direction in learning should be seen as a product of the interaction between the learners and their environment. In other words, these writers have suggested that the outcome of student self-direction in learning may be influenced by a range of factors, such as students’ personal characteristics and their learning environment.

Biggs’s (2003) ‘3P model of teaching and learning’ - a model that exemplifies factors influencing students’ learning outcomes - provides a conceptual basis for this study’s investigation of self-direction in learning amongst nursing students in Taiwan. The 3P model consists of three groups of factors (3Ps): presage; process; and product factors. Presage factors refer to the variables that exist prior to the actual engagement in learning. Biggs (2003) identified two types of presage factors: student characteristics and teaching context. Process factors refer to the approaches to learning utilised by students (Biggs, 1987), which are suggested to be influenced by the presage factors. Product factors refer to the nature of student learning outcomes, such as academic performance and the development of learning skills (Biggs, 2003; Biggs & Moore, 1993). This model suggests that product factors are affected by both presage and process factors.

Student self-direction in learning is considered as an outcome of education, and is therefore proposed as the product factor in this study’s conceptual framework. Specifically, students’ self-direction in learning is measured and represented by their level of SDL readiness (Fisher et al., 2001; Guglielmino, 1977).
1.4.2 Research purposes and design

The literature has suggested that nurse educators in Taiwan may incorporate student-directed learning activities in their teaching to improve students’ self-direction in learning (Chung et al., 1999; Kuo et al., 2000; Tseng et al., 2006). However, no published studies were found regarding students’ experiences of learning activities introduced to encourage self-direction or factors influencing students’ development of SDL readiness. This highlights the need for a thorough investigation into Taiwanese nursing students’ experiences of these learning activities within their undergraduate program. The purposes of this study are to:

1. Understand Taiwanese nursing students’ experiences of learning activities introduced to encourage self-direction in their undergraduate programs;
2. Identify factors influencing SDL readiness of nursing students in Taiwan.

To achieve these aims, a two-staged mixed-method research design was chosen. A qualitative approach is used for the first stage, a quantitative approach for the second. The first stage of this study involves a semi-structured interview aimed at exploring students’ experiences of learning activities which they perceived to be self-directed and their perceptions of factors relevant and influential to the outcome of these learning activities. Results from this investigation were used to complement the second stage of this study by providing a background of nursing students’ experiences with learning activities in the undergraduate program.
and a detailed description of students’ perceptions of factors influencing their self-direction in learning.

The second stage of this study, quantitative in method, consists of two phases: instrument pilot testing and a cross-sectional survey. In this stage, survey instruments were translated and the reliability of translated instruments was tested with a convenience sample of nursing students in Taiwan. Afterwards, the relationships between the factors comprising this study’s conceptual framework were examined by surveying a large sample of undergraduate nursing students. Figure 1.2 shows the two stages of the study and the research methods employed in each.

Figure 1.2: Stages one and two of this study

![Diagram showing stages and methods](image)

1.4.3 Significance of the study

This study is significant in three aspects. Firstly, the results will provide an in-depth description of Taiwanese nursing students’ perceptions and experiences of learning activities introduced to encourage self-direction, which may improve the understanding of teaching and learning practices regarding SDL in Taiwan’s undergraduate nursing programs. Secondly, the results will identify factors influencing student self-direction in learning and explain how these factors may affect the development of SDL readiness.
Such information may be useful to prepare nurse educators for the challenges associated with implementing active learning strategies to improve student self-direction. In addition, such information may be used to guide teaching design and to prepare a learning environment which is appropriate for students to develop better self-direction in learning. Thirdly, this study will provide empirical evidence about the relationships between students’ personal characteristics, the learning environment, learning approaches and their SDL readiness. These results will contribute to a deeper theoretical understanding of the development of student self-direction in learning.

1.5 Overview of the Thesis

In this thesis, a review of the relevant literature is presented in Chapters Two and Three. Chapter Two consists of a review of the literature on SDL. Theoretical perspectives and definitions of SDL are highlighted. A summary of relevant empirical research on SDL in nursing education is presented. Chapter Three provides the conceptual framework for this study. Theories of student approaches to learning and student learning models are described, followed by the elaboration on Biggs’s (2003) ‘3P model of teaching and learning’. Based on the 3P model and the relevant literature, factors that may influence students’ SDL readiness are proposed, and the conceptual framework for this study is presented.

Chapter Four outlines the research methodology and methods used in this study. The rationale for mixed-method design is addressed, followed by a description of the research population. Research aims, data collection and analysis procedures for both stage one and stage two studies are described.
Ethical considerations are outlined in the final section of this chapter.

Chapter Five presents the results from the stage one (semi-structured interview) study. In Chapter Six, results of instrument pilot testing and cross-sectional survey are reported. In Chapter Seven, findings relating to students’ experiences of learning activities introduced to encourage self-direction in learning and the relationships between the factors proposed in the conceptual framework are discussed. Based on the research findings, implications and recommendations for practice and future research are outlined at the end of this chapter.
Chapter 2: Self-direction in Learning

2.1 Introduction

This chapter presents a summary of literature relating to self-directed learning (SDL). The first part of this review introduces definitions and conceptual models of SDL present in the literature (Sections 2.2, 2.3). The second part of this chapter outlines the teaching strategies and learning programs for promoting students’ self-direction in learning suggested by SDL writers and researchers (Section 2.4). Empirical findings relating to how students perceive learning activities and programs regarding SDL are described in Section 2.5. Finally, a critique of the SDL concept is presented in Section 2.6.

2.2 Definitions of SDL

The origins of self-directed learning can be traced back to John Dewey. Dewey proposed that all persons are born with an unlimited potential for growth and development. He defined education as the agency that facilitates this growth and cautioned that the teacher should be the one who guides but does not interfere with nor control the process of learning (Dewey, 1938). The term self-directed learning was later introduced in Houle’s (1961) research on the motivation of learners. Tough’s (1979) research of adult learning and Knowles’s (1975) Adult Learning theory then made SDL a popular concept in educational theory and research.

As the body of research about SDL has grown, various definitions of self-directed learning have emerged throughout the literature. Knowles (1975) defined SDL as:
... a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes (p.18).

This definition is cited by many authors as the basis of other SDL definitions. For example, Iwasiw (1987) emphasised that self-directed learners are responsible for: identifying their own learning needs; determining their learning objectives; deciding how to evaluate learning outcomes; identifying and pursuing learning resources and strategies; and evaluating the end product of learning.

Guglielmino (1977) discussed SDL from a different perspective. She believed learners who are self-directed had certain attributes, in terms of the attitude towards SDL and abilities to be self-directed in learning, which are essential to the SDL process. She argued these attributes “ultimately determine whether self-directed learning will take place in a given situation” (p.34). With these attributes, a learner’s self-direction can occur in a wide variety of situations, ranging from a teacher-directed classroom to a self-planned learning project. More recently, Guglielmino and Guglielmino (1991) have suggested that, in addition to the learner’s attributes, the learning environment may influence the process of SDL. For instance, lack of resources in the learning environment, authoritarian instructors, and lack of time or unexpected incidents may result in learners re-evaluating or re-directing their learning (Guglielmino & Guglielmino,
Brockett and Hiemstra (1991) explored the concept of SDL, recommending that SDL is often thought as both an instructional process and a personality characteristic. They distinguished these two domains of SDL by using different terms: ‘self-directed learning’ referring to the instructional process, and ‘learner self-direction’ referring to the personality characteristic. Self-directed learning was defined as “the process that a learner assumes primary responsibility for planning, implementing, and evaluating the learning process” (p.24), while learner self-direction “centres on a learner’s desire or preference for assuming responsibility for learning” (p.24).

Brockett and Hiemstra (1991) combined these two domains and argued that SDL refers to:

...both the external characteristics of an instructional process and the internal characteristics of the learners, where the individual assumes primary responsibility for learning experience (p.24).

Candy’s (1991) writing on SDL also provided a multi-level definition of SDL. He distinguished self-direction as an outcome of education from self-direction as a method of education. As an outcome, self-direction is composed of personal autonomy and self-management skills, referring to learner’s personal characteristics, willingness and capability to conduct one’s own education. As a method, Candy broke self-direction down into learner control and autodidaxy (self-teaching), referring to instructional methods in formal and informal settings. Importantly, Candy (1991) made
the link between self-direction as a method and self-direction as an outcome. He argued that the teacher’s implementation of appropriate teaching methods may promote the educational outcome of improved learners’ autonomy and ability to manage a SDL process.

SDL is defined differently by different authors. However, Merriam and Caffarella (1999) summarised that SDL is commonly defined as a process “in which people take the primary initiative for planning, carrying out, and evaluating their own learning experiences” (p.293), as well as a “personal attribute” (p.305) in which the learner’s initiative, ability and willingness of taking control over a SDL process is essential (Brockett & Hiemstra, 1991; Candy, 1991; Fisher et al., 2001; Guglielmino, 1977).

These two definitions of SDL are also suggested to have a reciprocal relationship (Brockett & Hiemstra, 1991). That is, when learners are appropriately instructed through learning processes which encouraging self-direction, their attributes of self-direction in learning can be improved; when learners’ self-direction in learning is improved, they are more likely to take responsibility for and be self-directed in their own learning (Brockett & Hiemstra, 1991; Candy, 1991; Guglielmino, 1977).

In the research conducted for this thesis, the definition of SDL that will guide the investigation is consistent with writers who have described SDL as individual characteristic or ability. Specifically, while SDL abilities may be fostered by the use of particular learning activities that promote self-direction in learning, SDL for the purposes of this study is defined as nursing students’ individual attributes, in terms of their ability and
willingness, to be self-directed in learning. In the present study, the extent to
which nursing students possessed these attributes of self-directed learning is
represented by their self-directed learning readiness. The definition and
measurement of self-directed learning readiness are described in Chapter
Four, Section 4.4.1.2.

2.3 Conceptualising SDL

To describe the complexity of SDL and understand the development of
learners’ self-direction in learning, SDL writers generated a number of
conceptual models for SDL. These conceptual models fall into three
categories: linear, interactive and instructional models (Merriam &
Caffarella, 1999).

2.3.1 Linear models

Early models of SDL are linear in nature and describe learners as moving
through a series of steps to reach their learning goals in a self-directed
manner (Knowles, 1975; Tough, 1979). One example of these linear models
is that proposed by Knowles (1975). He described six steps for SDL:
climate setting; diagnosing learning needs; formulating learning goals;
identifying human and material resources for learning; choosing and
implementing appropriate learning strategies; and evaluating learning
outcomes.

Linear models of SDL typically describe key elements and the process of
self-planned learning in a sequential approach, which simply conceptualises
SDL as a series of inter-related learning activities. The learner’s personal
attributes, in terms of ability and willingness to be self-directed in learning
are not discussed in these models.

### 2.3.2 Interactive models

Other writers have argued that SDL should be conceptualised at an interactive level (Brockett & Hiemstra, 1991; Garrison, 1997; Grow, 1991). Interactive models, such as the Personal Responsibility Orientation (PRO) model (Brockett & Hiemstra, 1991) and Garrison’s (1997) model, examine learner characteristics and the instructional process, which “interact to form episodes of self-directed learning” (Merriam & Caffarella, 1999, p. 295).

The PRO model, developed by Brockett and Hiemstra (1991), provides a framework to explain self-direction in learning. This model contains three components: personal responsibility; learner self-direction; and self-directed learning. Firstly, this model recognises that learners must take personal responsibility for the teaching-learning transaction, which is dependent on learner self-direction (i.e., learners’ desire or preference for assuming responsibility for learning). Secondly, self-directed learning, viewed as an instructional process, is used by the instructor to facilitate learners in “planning, implementing, and evaluating learning” (p.28). The learning activities and the learner exist in a social context that affects the learner and the SDL process. However, the authors did not provide in-depth discussion about these social contextual issues.

Garrison’s (1997) model provides a multi-dimensional and interactive framework for SDL. This model integrates dimensions of learner’s self-management, self-monitoring and motivation to reflect a meaningful approach to SDL. The first dimension, self-management, involves learners
taking control of, and managing, the contextual conditions that they can reach their stated goals and objectives. The second dimension, self-monitoring, addresses cognitive and meta-cognitive process, that is, “the learner takes responsibility for the construction of personal meaning of the learning” (p.23). The third dimension, motivation, refers to the reasons that influence a person to participate in a SDL activity and to persist in the activity. This model highlights three important attributes of a learner: motivation, self-management and self-monitoring skills, which interact to achieve SDL. However, this model does not address the interaction between the learner and their environment.

Interactive models conceptualise SDL at a multi-dimensional level, with learners’ characteristics being central to the SDL process. SDL is not merely a series of learning activities, but a learning process which is primarily influenced by learners’ willingness to take responsibility for learning and their abilities (self-management and self-monitoring skills) to achieve self-directed in learning. Instructional methods of SDL can be given to learners by the instructor to facilitate or reinforce learners’ self-direction in learning. While these interactive models may describe SDL in a more comprehensive manner than linear models, there is limited research that has explored these concepts or tested these models (Merriam & Caffarella, 1999).

2.3.3 Instructional model

Some writers conceptualise SDL on the basis of instructional methods. The instructional models, including Grow’s (1991), and Hammond and Collin’s (1991) models, represent “frameworks that instructors in formal settings...
use to integrate self-directed methods of learning into their programs and activities” (Merriam & Caffarella, 1999, p.302). The aim of these instructional methods is to encourage students to become independent and self-directed in learning. For example, Grow (1991) proposed the Staged Self-Directed Learning (SSDL) model to outline how teachers can assist students to become more self-directed in their learning. He suggested that students may go through four different stages: dependent; interested; involved; and self-directed. The purpose of teaching is to match the learner’s stage with suitable learning activities and instruction.

The SSDL model suggests that students in stage one (dependent) are low in self-direction and rely heavily on teachers for guidance. Therefore, teacher-directed learning activities, such as informational lectures and guided discussions, can be provided to enhance their motivation and ability to become self-directed learners. Those who are at stage two (interested) have moderate self-direction and are interested in learning. These students can become increasingly self-directed when initially given praise and encouragement. The model suggests that teachers in this stage can act as motivators and provide inspiring lectures and structured activities in which students can be encouraged to be active in learning (Grow, 1991).

Intermediate self-direction typifies stage three (involved) learners in this model. They are active learners but they may need guidance. Teachers can facilitate the learning process by offering resources and methods of gaining knowledge and sharing decision making regarding learning goals and evaluation (Grow, 1991). Appropriate learning activities for learners at this stage may include seminars and group projects. Students at stage four
Chapter 2

(self-directed) are high in self-direction. The model suggests that students in this stage consult teachers/experts but “are able and willing to take responsibility for their learning, direction and productivity” (Grow, 1991, p.134). Teachers of these students need to be learner-centred. They can delegate tasks to the learner and may ask the learner to set up a timetable for completion. Independent studies and dissertations are examples of self-directed learning projects for students at this stage.

The SSDL model focusing on teachers’ instructional process has received criticism. Tennant (1992) questioned the utility and explanatory power of the SSDL model by asking ‘who is the best person to judge which stage a student is at?’; ‘How should this be done if there is a mismatch between the students’ ability and willingness to use self-directed learning methods?; and ‘When, in the learning process, should teachers change from one stage to another?’

In response to Tennant’s questions, Grow (1994) stressed that the SSDL model is a concept for teachers to lead students from being ‘less independent’ to ‘more independent’ in their learning. In the SSDL model, Grow (1991) suggests a series of learning activities, ranging from teacher structured activities to student independent studies, may help students at different stages improve their self-direction in learning. The essence of these activities is the involvement of student-direction, in which students are partially or totally responsible for their learning tasks. The teachers’ task is to work with students and introduce suitable learning activities. With teachers’ facilitation, students undertaking these self-directed activities are encouraged to become active and independent in learning and their abilities
to be self-directed in learning can be improved.

### 2.4 Facilitating Self-direction in Learning

SDL is defined in many different ways, however, it is generally believed that learners’ self-direction in learning is central to the learning process and that this can be developed and facilitated through appropriate learning activities and instruction (Brockett & Hiemstra, 1991; Candy, 1991; Grow, 1991; Knowles, 1983). Many SDL writers have suggested active teaching and learning processes to help facilitate students’ self-direction. For example, Brockett and Hiemstra (1985) emphasised three important principles of teaching strategies for promoting SDL: using a variety of teaching and learning resources; using a teaching role that is facilitative rather than didactic; and encouraging an active role by students during the entire teaching and learning process.

Similar to Grow’s (1991) SSDL model which suggests teaching and learning activities should be implemented according to students’ stage of self-direction (i.e., dependent, interested, involved and self-directed), Gibbons (1994) suggested the practice of facilitating students’ SDL requires three stages. Firstly, students are “learning how to learn from a teacher” (Gibbons, 1994, p.5), which implies that students at this stage are the recipients of teaching and rely on the transmission of knowledge from teachers. Teachers carefully teach the course content and manage students’ studies. Secondly, when students become more interested in the learning process, they are able to “learn how to teach a course to oneself” (Gibbons, 1994, p.5). Students at this stage are taught how to organise learning content, manage learning schedules and achieve course outcomes independently.
Finally, when students are becoming capable of independent study, “learning how to direct one’s own learning” (Gibbons, 1994, p.5), they are encouraged to decide their learning goals and make plans to pursue them.

The instructional processes proposed by Grow (1991) and Gibbons (1994) emphasise that learning activities and facilitating strategies should be given according to students’ level of self-direction. However, a review of the literature did not locate any empirical studies of higher education which have examined the instructional processes as described in these models.

Empirical nursing research investigating how to improve student self-direction in learning has mainly concentrated on the effectiveness of various teaching approaches. A number of articles were found describing the implementation of designed learning activity or program, such as learning contract, SDL modules or PBL program, within nursing courses. The improvement of students’ self-direction in learning (often measured by SDL readiness) was a key outcome of interest in these studies (Clark, 1990; Kang, 2002; Wiley, 1983; Williams, 2002).

An early investigation of students’ SDL readiness identified in the nursing literature was a controlled experimental study conducted by Wiley (1983). The purpose of this research was to examine the effects of a 12-hour SDL project. The sample of 104 pre-registration nursing students was divided into an experimental group and a control group. Students’ readiness for SDL was measured using Guglielmino’s (1977) Self-Directed Learning Readiness Scales (SDLRS). Wiley (1983) concluded that students in the intervention group (undertaking the SDL project) did not report higher
SDLRS scores than those in the control group, suggesting the implementation of this SDL project had limited effect on improving student SDL readiness. However, the limited hours of intervention may have limited the effect of SDL project. Moreover, the small sample size in this study may limit the generalisability of results.

More recently, Williams (2002) implemented a one-semester PBL program in a Canadian university within one semester. A group of first-year undergraduate nursing students undertook this program, 135 of them completed the questionnaires before and after the PBL intervention. Results suggested that a slight increase in students’ SDL readiness was found after the intervention, however, this increase was not statistically significant.

The above examples may suggest that the implementation of learning programs has limited effect on improving student SDL readiness. However, an additional finding from Williams’s (2002) study was that students’ perceptions of independent learning opportunities were significantly associated with students’ SDL readiness. This can be seen as a reminder that the development of SDL readiness may not be associated with what learning activities have been implemented but more about how they were implemented.

In summary, SDL writers have suggested various instructional processes that may be important to developing SDL abilities. Nursing researchers have subsequently studied the effectiveness of particular learning activities and programs aimed at facilitating student self-direction in learning. More recent theories of SDL have further suggested that such instructional processes
should be provided according to students’ level of self-direction (Grow, 1991; Gibbons, 1994). However, there appears to be limited empirical evidence to support these key propositions at this time. One explanation for the limited evidence to support such theories may be that the modern mass education system is not conducive to the delivery of such individualised and tailored approaches to education. With the increasing number of students in many nursing courses today, it may not be as possible for university teachers to attend to individual student’s learning needs (Ramsden & Elaine, 1996). Such contextual factors may therefore limit the applicability of these educational theories in today’s higher education environment and may at least partially explain the limited empirical research in this area.

In addition, these theories and empirical findings have based their arguments on the perspective of teaching rather than student learning. Some researchers have argued that students’ perceptions of the learning activities and programs, such as the opportunity to be independent in the learning task (Alspach, 1991; Williams, 2002) and facilitation and assessment methods (Clark, 1990; Kang, 2002), may need to be considered other than the mere implementation of learning activities. This suggests that an understanding about students’ perceptions and experiences of SDL in the university is needed.

2.5 Student Perceptions of SDL

SDL has been a popular concept among educators and researchers of health professional education (Kell & Van Deursen 2000; Miflin, 2004). In the nursing profession, SDL is not a new concept in education (Nolan & Nolan, 1997a, 1997b; O'Shea, 2003; Pedley & Arber, 1997). However, recent
nursing studies have reported that nurse educators and students experienced confusion when SDL related learning activities were implemented in the university (Hewitt-Taylor, 2001, 2002; Lunyk-Child et al., 2001).

Hewitt-Taylor (2001; 2002) investigated nurse educators’ and students’ perceptions of the term ‘SDL’ using multiple qualitative methods including interview, field diary and observation. Data were collected from 28 students and eight teachers in a nursing school in the UK. The findings indicated that both students and teachers had difficulty defining SDL, and that they did not have the same understanding of its nature and purposes. For example, almost half of the teachers and students in this study associated SDL with students learning alone. This interpretation left them confused about whether or not teachers should provide students with support. Furthermore, many of the teachers and students linked SDL with students taking responsibility for their learning, however, some students felt that SDL could be an easy teaching option for teachers.

Lunyk-Child and colleagues (2001) conducted focus group interviews exploring nurse educators’ and students’ perceptions of SDL and factors that facilitate and impede students’ SDL process. They interviewed 47 teachers and 17 students from an undergraduate nursing program in a Canadian university. Results from this study suggested that both teachers and students were able to define SDL, however, they were struggling with the inconsistency in use of self-directedness (i.e., when should be teacher-directed and when student-directed), searching for confirmation of what is the right or wrong way for SDL activities to be implemented and of when it is appropriate to give students help or ask teachers for help. Thus,
they were calling for ongoing professional development for teachers and appropriate support and resources for students. This study pointed out the uncertainty and confusion between nurse educators and students when SDL activities were used in university teaching. However, it did not suggest factors that may facilitate or impede student self-direction in learning.

Nolan and Nolan (1997a; 1997b) used questionnaires to survey nursing students’ expectations of a SDL course. Forty-five students at the start of this course participated in this study. Results indicated that, firstly, students believed an open climate is valuable, that is, a learning environment in which the student’s welfare matters and is fostered within a spirit of teamwork and cooperation. This implies that teachers treat students on an equal basis. Secondly, students appreciated a flexible and open approach to their course, whereby students were encouraged to choose a variety of learning methods. However, when it comes to matters of control, it seemed that students expected the teacher to take the lead, for example, they believed teachers are responsible for evaluating the effectiveness of the course by determining what specific knowledge and skills students should acquire. This study highlighted three important aspects, an open learning climate, flexibility of learning methods and a balance of control over the learning process, may contribute to students’ positive experiences with SDL. However, participants in this study were at the early stage of this course, and their experience of SDL may have been limited. In addition, this study did not further explore the relationship between these factors and the development of student self-direction in learning.

Despite SDL being a popular concept in nursing education since the 1980s,
findings from the above studies suggest that the concept of SDL is not clearly understood by nurse educators and students (Nolan & Nolan, 1997a; O’Shea, 2003). Teachers may expect students to be independent in the context of SDL (Hewitt-Taylor, 2001, 2002; Lunyk-Child et al., 2001), while students expect teachers to take control over at least a part of the learning process (Nolan & Nolan, 1997a, 1997b). The differences in expectations between teachers and students are thought to result in confusion about when and whether or not to assist students in the SDL process, which further causes anxiety and frustration to both teachers and students during the SDL process (Hewitt-Taylor, 2001, 2002; Lunyk-Child et al., 2001).

2.6 A Critique of SDL

Previous discussion has suggested that students sometimes feel frustrated and confused in the process of SDL (Hewitt-Taylor, 2001, 2002; Lunyk-Child et al., 2001). This finding may raise questions about students being self-directed in learning, such as: ‘To what extent can students be self-directed in formal education settings?’ and ‘Does every student want to be self-directed in learning?’ These questions imply certain criticisms of the concept of SDL.

2.6.1 Criticisms of the assumptions of SDL

Brookfield (1986) challenged whether the term self-directed learning is a misnomer. He argued that pursuing self-directed learning to its extreme is not possible, especially with the constraints of professional education (Nolan & Nolan, 1997a). The so-called self-directed learners are often influenced by other people, the environment and available resources
surrounding them (Brookfield, 1986; Guglielmino & Guglielmino, 1991; Hammond & Collins, 1991; Roberson, 2005). These factors are inextricably linked, and may affect the learner’s ability and willingness to develop self-direction in learning. For example, limitations of ability, time and resources may hinder the learner from making independent decisions about his/her learning goals.

Secondly, Knowles (1983), in his theory of Adult Education, assumed that adult learners are more likely to be self-directed in learning than children. Brookfield (1986) questioned whether SDL was necessarily associated with age, noting that some adults may be self-directed, while others may prefer a teacher-directed learning structure (Brookfield, 1986; Darbyshire, 1993; Merriam, 2001). Knowles (1990) responded to these criticisms by advancing his argument that child and adult education do not constitute a dichotomy but are two points of a continuum, with teacher-direction at one end and self-direction at the other. Some adult learners may be dependent and find it difficult to be self-directed in learning, however, Knowles (1983, 1990) believed that learners’ self-direction can be improved through appropriate instructional learning formats. That is, teachers may be able to help adult learners move from being teacher dependent to being self-directed by introducing appropriate learning experiences and activities (Candy, 1991; Knowles, 1983, 1990).

2.6.2 SDL and Chinese learning culture

The lack of discussion of SDL in different cultural contexts has also been criticised. It is suggested that SDL may not be sensitive to culturally diverse education, and in fact, may only reflect a western mindset (Baumgartner,
Lee, Birden, Flowers, & Clearinghouse, 2003; Merriam, 2001; Pratt, 1993). The concept of SDL emphasises learner’s autonomy and independence suggesting students should be active in learning. For students from a Chinese cultural background where an obedient and submissive attitude is often reinforced, the freedom of selecting and/or self-managing assignments in SDL may not be an appropriate learning style (Baumgartner et al., 2003; Salili, 1996).

Students in Chinese societies such as China, Taiwan and Hong Kong are often described as being quiet, passive and compliant in the classroom. They are often perceived as students who rarely ask questions or volunteer answers in class either in their own countries or overseas (Biggs & Watkins, 1996; Watkins & Biggs, 2001). Researchers suggest that Chinese culture and beliefs have a significant impact on these learners in shaping their thinking and learning behaviours (Biggs & Watkins, 1996; Chan, 1999; Kennedy, 2002; Watkins & Biggs, 2001).

Chinese culture is often characterised as being low on individualism and high on collective values due to the emphasis on ‘harmony’ enshrined in the teaching of Confucius (Chan, 1999; Kennedy, 2002). In Chinese culture, harmony is valued; emphasis is usually placed on individuals adapting to the collective, accommodating others and avoiding conflict to maintain this harmony (Chan, 1999; Baumgartner et al., 2003). Children are often taught to have respect for older people and for high rank, and to obey their parents, elder family members and teachers (Salili, 1996).

This cultural background is deemed to be one of the influences of learning...
and teaching styles in Taiwan. Teachers are often respected by students and parents because they are seen to play a central role in students’ educational establishments (Salili, 1996; Salili, Chiu, & Hong, 2001). Teachers are also often regarded as having the authority and power to decide what will be taught and how it will be taught (Chan, 1999). In addition, the competitive exam system is common, and is believed to influence teaching styles, where the classroom usually appears authoritarian to maintain control, and teaching is often focused on preparation for examinations (Chan, 1999; Ho, 2001; Salili et al., 2001). Such exam-oriented teaching and learning styles are suggested to be associated with students’ expectation of being ‘spoon-fed’ in the class in order to prepare for exams and to achieve academic success (Chan, 1999).

Some evidence supports the view that Chinese learners may prefer passive teaching and learning styles. For example, Cortazzi and Jin (2001) researched Chinese university students’ concepts of good teaching and compared their findings with those of students from Britain. Chinese students reported that one positive aspect of a good teacher was having deep knowledge, however, British students did not share this view. For the belief that a good teacher should organise a variety of activities, Chinese students’ ratings were significantly lower than that of the British. These findings may suggest that Chinese students are likely to look up to their university teachers as sources of knowledge and expect to be taught by the teacher. They have lower expectation of participating in different learning activities in the classroom than British students do. This study suggested the preferred teaching and learning style between Chinese and British university students may be different. However, instruments in this study were investigator
developed, and no pilot test was conducted prior to this study. Questions therefore remain regarding the reliability and validity of results.

Another study similarly implied that students in Taiwan may prefer passive learning styles. Cheng’s (2001) study investigated the preferred learning styles of students and teachers across seven departments from a university in Taiwan. Data were obtained from 68 teachers and 666 students who completed survey questionnaires. Results identified that students most preferred auditory styles of learning, such as lectures, and considered individual styles, such as individual project, as their least preferred style. On the other hand, teachers preferred students to demonstrate their learning through the kinaesthetic and group styles, such as group discussions and seminars, to a greater degree than the students themselves wanted. These findings suggested a considerable disparity between the preferred teaching and learning styles of university teachers and students in Taiwan. However, the data were collected from one university and therefore the findings may not be transferable to other settings.

Despite the difficulties inherent in all students achieving full self-direction in learning, the concept of SDL has put learners on the centre stage of learning (Brookfield, 1986). That is, the learner’s self-direction is seen as being essential to the learning process. Therefore, improving students’ self-direction in learning is an important goal of higher education (Betts, 2004; Canipe & Brockett, 2003; Patterson et al., 2002; Wilcox, 1996).

As for Taiwanese students, cultural influences have been suggested as being one of the contributors to their preference for a passive learning style (Biggs
Such preference may further result in their resistance to participation in self-directed activities. However, it is important to avoid stereotypes, and to recognise individual differences of students and the influence of modern education. As stated in Chapter One, recent educational reform in Taiwan encourages university teachers to use student-centred teaching strategies. This emphasis may have increased the adoption of student-directed learning activities in teaching, with increasing opportunities for students to participate in active learning and, in turn, their attitude towards self-directed in learning may have changed.

2.7 Summary

In this chapter, definitions and conceptual models of SDL were discussed. SDL is commonly defined as a learning process, as well as an educational outcome which can be improved by appropriate instructional methods. Methods to facilitate students’ self-direction in learning, including instructional processes suggested by SDL writers and empirical studies investigated effectiveness of teacher-designed activities, were described. A conclusion was drawn from the review that student self-direction in learning may be associated with how learning activities were implemented rather than what have been implemented. That is, students’ perceptions of how they were facilitated towards self-directed in a learning environment may be significant to their development of SDL readiness.

This review then focused on studies investigating students’ perceptions and experiences of SDL activities. The study of Nolan and Nolan’s (1997a) highlighted that students perceived an open learning climate, flexibility of
learning methods and a balance of control over the learning process are important to their positive experiences of SDL. These perceptions may contribute to students’ development of SDL readiness. In order to understand what factors may influence the development of SDL readiness, a further review of theories and research of student learning was undertaken and the conceptual framework for the present study is presented in the next chapter.
Chapter 3: Conceptual Framework

3.1 Introduction

The concept of SDL has put learners on the centre stage of learning, in that, the learner’s self-direction in learning, in terms of their ability and willingness to be self-directed, is seen to be essential to the learning process (Brookfield, 1986). Improving students’ self-direction in learning is thus seen as an important outcome of education (Brockett & Hiemstra, 1991; Candy, 1991; Guglielmino, 1977). In recent years, research and practice in higher education has used theories relating to student approaches to learning to investigate factors influencing student learning outcomes. These theories are considered to be relevant and important to education because they encourage an understanding of student learning and provide a systematic approach to academic teaching (Diseth, Pallesen, Hovland, & Larsen, 2006). This chapter reviews theories of student approaches to learning to guide this study’s investigation of factors influencing students’ SDL readiness.

This chapter starts with a description of theoretical perspectives and models of student approaches to learning (Sections 3.2 to 3.3), followed by a critique of these theories and models (Section 3.4). Biggs’s (2003) ‘3P model of teaching and learning’, which forms the basis of this study’s framework, is further elaborated in Section 3.5. The conceptual framework for this study, including the factors proposed to influence students’ development of SDL readiness and the relationships between these factors, is described in Section 3.6.
3.2 Theories of Student Approaches to Learning

Learning is a process that human beings undertake every day. Research about learning has been guided by many different theoretical perspectives. For example, a large body of psychological research into learning has concentrated on memory investigation (Jarvis, Holford, & Griffin, 2003). Other notable groups of researchers have been influenced by behaviourists, who have focused on examining how learning occurs in response to outside environmental conditions and stimuli (Jarvis et al., 2003).

Over the past 30 years, researchers have argued that human learning is a more sophisticated process than just memorising information or reacting to environmental stimuli (Watkins, 1996). From this perspective, learning is not seen as the accumulation of information, but as the construction and transformation of knowledge (Watkins, 1996). Many important features of the learning process, such as the degree of engagement of the learner, the content of learning and the method of learning, have been explored by researchers seeking to understand human learning. One of the areas educational research has focused on is how students approach their learning in terms of the adoption of learning strategies, the development of understanding, and the effects of these approaches on learning outcomes (Biggs, 2003; Marton & Saljo, 1997; Ramsden, 2003).

In the late 1970s, Marton and Saljo (1976a; 1976b; 1979) at Gothenburg University in Sweden described deep and surface approaches to learning. In these early studies, students were asked to read a selected academic article. Questions were designed to assess what students had understood from the task and how they approached the task. The results revealed two distinct
approaches to learning: a surface approach, where the intention was to try to memorise details or key terms in order to reproduce the answers to questions; and a deep approach, where the intention was to try to understand themes and meaning. Marton and Saljo (1976a) regarded the surface approach as a sign of learning focused on memorisation of knowledge, while the deep approach referred to learning focused on comprehension of the reading.

Entwistle and Ramsden (1983) extended the investigation of student approaches to learning but from a quantitative perspective. They developed the Approach to Study Inventory (ASI) and surveyed 2208 second-year undergraduate students across six disciplines. The results revealed four orientations related to approaches to learning, namely: meaning; reproducing; achieving; and non-academic (Table 3.1). A meaning orientation is described as being associated with a deep approach; that is, students are learning with great interest, and with the ability to comprehend the learning content and inter-relate ideas. A reproducing orientation is associated with surface approaches, involving extrinsic motivation (e.g., fear of failure) and memorisation of learning content. An achieving orientation is described as a strategic approach, characterised by the intrinsic motivation to achieve academic success and adoption of both deep and surface learning strategies depending on the task requirement. Finally, a non-academic orientation, as its name implies, is seen to refer to disorganised study methods, negative attitudes to studying, and lack of motivation.
Biggs (1987) also investigated students’ approaches to learning using quantitative methods. He reviewed the available literature on student learning and developed the Study Process Questionnaire (SPQ) to measure the learning approaches of higher education students. In Biggs’s study, a learning approach was defined as “a composite of a motive and an appropriate strategy” (p.10). Under this definition, each learning approach was composed of motives – the student’s reasons or intentions for undertaking study – and of corresponding learning strategies.

Three learning approaches were proposed by Biggs (1987): surface; deep; and achieving (Table, 3.2). A deep approach to learning indicates that students are motivated by an inherent interest in a certain subject and employed strategies such as reading widely, seeking in-depth meanings, and integrating new knowledge with past experiences. A surface approach to learning denotes that the student’s motive is to meet the minimum requirement of the course or simply to pass tests, with only a limited
personal interest in the subject. In this approach, strategies such as completing minimal readings, reproducing information from authors, or memorising key words and possible answers for examinations would be adopted. Students with an achieving approach are stimulated by academic achievement or external rewards rather than by personal interest. Depending on the requirements of the learning tasks, both surface and deep strategies would be utilised strategically in order to achieve maximal performance.

Table 3.2: The motives and strategies of student approaches to learning (Biggs, 1987)

Research findings to support the existence of deep and surface approaches to learning have come from both qualitative (Marton & Saljo, 1976a) and quantitative (Biggs, 1987; Entwistle & Ramsden, 1983) studies. It is of interest to note that the definitions of deep and surface approaches to learning proposed by these three research groups are very similar. They all emphasise the intention or motive of the student is crucial, in that, what a
student intends to get out of learning determines whether deep or surface learning strategies will be more frequently used than the other (Beattie, Collins, & McInnes, 1997).

The third approach, the achieving approach, was proposed to describe the way in which students organise their time and working environment strategically (Biggs, 1987; Entwistle & Ramsden, 1983). Biggs (1987; 1993) suggested that students may adopt mixed approaches to learning. For example, an individual engaged in rote learning in a highly organised way is adopting a surface-achieving strategy, reading for meaning in an organised way is deep-achieving, while rote learning and seeking meaning, which has been considered an unlikely simultaneous combination, is surface-deep strategy (Biggs, 1993).

An issue related to learning approaches is that the early work on student learning by Entwistle and his colleagues (1974) proposed that individuals have predetermined and fixed approaches to studying. However, Gothenburg’s work stressed that individuals select an approach to studying in response to both particular task content and a particular context (Marton & Saljo, 1976a, 1979). That is, an individual’s study approach is flexible. For example, researchers found that the adoption of a surface or deep approach was influenced by the type of question asked in the tests, and student’s level of interest and anxiety (Fransson, 1977; Marton & Saljo, 1976a; Scouller, 1998). Entwistle and Ramsden (1983) acknowledged the potential influence of external factors on the study approach adopted by students, and no longer viewed the study approach as a fixed learning style determined by individual traits.
Marton and Saljo’s (1976a; 1979) studies also addressed qualitative differences in students’ learning outcomes in relation to the approaches they had taken to learning. Students who approached learning using surface strategies often remembered only isolated sentences and were not able to explain the meaning of the learning content. Those who used deep approaches to learning frequently showed better understanding, and were able to summarise an overview of the content. These findings suggest that students’ adoption of surface learning strategies, that is, memorising and rote learning, may lead to poor learning outcomes where students are less likely to comprehend the learning content. Deep learning approaches on the other hand may lead students to achieve better understanding of the content, and better learning outcomes (Biggs, 2003; Biggs & Moore, 1993; Ramsden, 2003).

In summary, researchers of student approaches to learning generally agree that students may be likely to adopt one learning approach more often than the other, however, their selection of learning approaches may be influenced by learning circumstances (Biggs & Moore, 1993; Entwistle & Ramsden, 1983; Marton, Hounsell, & Entwistle, 1997; Marton & Saljo, 1997; Prosser & Trigwell, 1999). The approaches taken by students are suggested to be dependent on a range of variables, including their motivation to learn, (Biggs, 1987; Biggs & Moore, 1993); teaching quality (Entwistle & Ramsden, 1983); and their perceptions of the learning situation (Prosser & Trigwell, 1999). Importantly, these theories propose that the adoption of particular learning approaches is believed to be associated with different learning outcomes.
This study proposes students’ self-direction in learning is an important outcome of learning. According to the theories of student approaches to learning described in this section, students’ self-direction in learning may be influenced by their adoption of particular types or approaches to learning.

### 3.3 Models of Student Learning

To describe the complex relationships between student approaches to learning, the learning environment and student learning outcomes, various models of learning have been proposed. Entwistle (1987) proposed a heuristic model of teaching and learning as a guide for improving teaching and research of higher education (Figure 3.3). This model suggests that a student’s overall perceptions of learning, including learning style, perceptions of meaning and relevance, approaches to learning and teaching style, are affected by characteristics of students (e.g., student motivation and intellectual abilities); of teachers (e.g., teaching methods and materials); and of the department (e.g., professional and/or academic standards). These perceptions further influence students’ learning strategies (approaches) and outcomes.
Figure 3.3: Model of teaching and learning (Entwistle, 1987)

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Ramsden (2003) also proposed a heuristic model of student learning which describes linkages and relationships among the factors that may influence student learning outcomes (Figure 3.4). In this model, the source of student learning outcomes can be traced through their learning approaches and their perceptions of the specific learning tasks. The students’ previous experiences and the learning context (i.e., the methods of teaching, curriculum design and assessment methods) directly or indirectly affect students’ perceptions of what is required of them.

*Figure 3.4: Model of student learning in context (Ramsden, 2003)*

Biggs (1984) proposed the ‘3P model’ as a way of explaining why students learn differently. He aimed to show that student learning is not a passive process, but rather an interaction between the learners and their learning environment. In this model, three sets of factors (3Ps) are at work: ‘presage factors’ include the characteristics of the student and the teaching context; ‘process factors’ refer to student’s approaches to learning; and ‘product factors’ refer to the learning outcomes (Biggs, 1993). In responding to his own and other research, Biggs has modified his model over the past two
decades. The most recent model, ‘3P model of teaching and learning’ (2003), provides a concise framework to describe the relationships between students’ learning outcomes are influenced by their study approaches, personal characteristics and the learning environment (Figure 3.5).

These models of learning comprise similar conceptions about how students learn. Students’ approaches to learning are seen to be linked to how students perceived the context of learning and the learning environment. That is, if a student believed that memorisation was rewarded, then the student would be more likely to choose surface strategies as appropriate for the learning context. The linked phenomena of student characteristics, perceptions of the learning context and approaches towards learning were seen to contribute to the outcome of learning: surface approaches leading to poorer outcomes (e.g., lower grades, lack of understanding in learning content, unsatisfactory learning experiences), and deep approaches to better outcomes (e.g., higher grades, better understanding of learning content, satisfaction in learning). These models seem to be describing a significant set of relationships about how students learn. Therefore, they have been used by a number of researchers in developing staff training programs and teaching designs across many disciplines in higher education (Byrne & Flood, 2003; Evans, Kirby, & Fabrigar, 2003; Lyon & Hendry, 2002; Snelgrove, 2004; Tiwari et al., 2006).
Figure 3.5: 3P model of teaching and learning (Biggs, 2003)

This figure is not available online. Please consult the hardcopy thesis available from the QUT Library.
3.4 A Critique of Theories of Student Approaches to Learning

Some research and practice in higher education has used student approaches to learning as its foundation. Webb (1997) challenged these theories by arguing that the binary notion of deep and surface learning approaches is too crude. For example, memorisation is associated with rote learning, which is often linked to a surface approach, lack of understanding, and poor results (Biggs, 1987; Entwistle & Ramsden, 1983). However, in studies with Chinese students, high achieving students appeared to be memorising in a way that led to understanding (Biggs & Watkins, 1996; Kember, 2000). Kember and associates (1999) describes this is an approach which “combines understanding with memorisation” (p.323). It has been argued that the learning style of Chinese learners is often repetitive-learning rather than mere rote learning (Kember et al., 1999; Kennedy, 2002). Such repetition may assist students to memorise and recall information, and then create a deep impression on the mind, allowing them to inter-relate ideas and discover new meanings from the material (Chan, 1999; Kember et al., 1999; Kennedy, 2002; Watkins & Biggs, 2001). Despite the suggestion that deep and surface approaches may be both adopted to achieve better learning results, no research was found to further investigate these issues.

As to models of student learning, some researchers have questioned whether the assumptions underpinning such perception/approach models may be biased. Haggis (2003) stressed that these models may make an elite set of assumptions about students’ purposes and motivation to learn. For example, the model assumes that students in higher education are prepared by secondary schooling, and are already at a level where they can engage with deep learning and are willing to gain better results. In addition, the model
assumes that students are able to make sense of the institution’s (or teaching staff’s) aims for education through the presentation of teaching and assessment methods. In the current mass higher education system, he believes that these perception/approach models could be seen to have constructed its goal in the image of academics themselves, rather than as representative of the goals of a wide range of students.

Indeed, one of the fundamental problems with the view of learning models is that they remove the richness and complexity of individual’s multiple contexts of learning (Haggis, 2003). While the relationships proposed in the models may hold for some students in higher education, there are a group of students where such general models may not represent their learning patterns (Lizzio, Wilson, & Simons, 2002). Some researchers have reported that, for academically weak or failing students, the relationships between their perceptions of learning context and the adoption of learning approaches may disintegrate (Entwistle, Meyer, & Tait, 1991; Lizzio et al., 2002; Meyer, Parson, & Dunne, 1990). Some students may be resisting or unable to engage with deep learning for reasons such as lack of adequate knowledge and skills (Prosser, Trigwell, & Waterhouse, 2000), being exhausted from part-time work or parenting or distracted by family or financial problems (Haggis, 2003). Researchers using these learning models need to be aware of and acknowledge the limitation of generalisability of research findings.

3.5 3P Model of Teaching and Learning

Previous sections have presented three models of student learning and the criticisms associated with these models. Whilst these models may not
Chapter 3

represent the learning pattern of all students (Haggis, 2003), they do provide frameworks to explain possible relationships between the learning environment, students and their learning outcomes (Biggs, 2003; Prosser & Trigwell, 1999; Ramsden, 2003). Among these learning models, Biggs’s (2003) 3P model is adopted by many studies as a research frame (e.g., Zhang, 2000; Drew & Watkins, 1998; Lizzio et al., 2002). This model suggests factors including students’ personal characteristics and teaching context are influential to students’ learning outcomes. These factors are also reflected in the writings of others in the field of SDL (Brockett & Hiemstra, 1991; Garrison, 1997; Guglielmino & Guglielmino, 1991). This model was, therefore, selected to provide the guiding framework for this study.

The 3P model addresses three sets of components (3Ps: presage, process and product) in the university teaching and learning environment, including factors of student characteristics, teaching context, student approaches to learning and learning outcomes (see Figure 3.5, p. 48).

3.5.1 Presage factors

Presage factors are the variables that exist prior to the actual engagement in learning. Initially, Biggs (1984; 1987) identified two types of presage factors: personal and situational. Personal factors included intelligence, abilities, personality, and home background. Situational context included course structure; time spent on the task (Biggs, 1987); teachers’ personal characteristics, teachers’ conceptions of learning and teaching, and teaching methods and assessment (Biggs & Moore, 1993).

As the model evolved, personal factors were relabelled as student
characteristics, consisting of three main items: prior knowledge, ability, and motivation (Biggs, 2003). The situational context was replaced by teaching context which consists of five items: objectives, assessment, climate in the classroom, and teaching and institutional procedures (Biggs, 2003; Biggs & Moore, 1993). These presage factors are believed to have direct influences on process and product factors. The relationships are explained in the next sections.

### 3.5.2 Process factors

Process factors refer to the learning approaches utilised by students (Biggs, 1987, 2003). It is suggested that the presage factors influence the learning process which determine students’ learning-related strategies. That is, students’ personal characteristics and the teaching context affect the way students perceive the learning tasks, which in turn influences the decision to adopt particular learning approaches (Biggs, 2003; Prosser & Trigwell, 1999; Ramsden, 2003). The adoption of particular learning approaches further influences learning outcomes (Biggs, 2003; Marton & Saljo, 1976a; Ramsden, 2003). Therefore, it is suggested in this model that presage factors have direct influences on process factors, which further influence product factors.

### 3.5.3 Product factors

The final component of the 3P model is product factors, that is, learning outcomes. Student learning outcomes can be assessed quantitatively, qualitatively and affectively (Biggs, 2003; Biggs & Moore, 1993). Quantitative measures of learning outcomes often refer to academic performance indicators, such as grades or marks for exams and assignments.
Qualitative measures may include observations of students’ understanding of learning tasks or students’ attribute to specific learning orientations such as SDL readiness (Biggs, 2003; Biggs & Moore, 1993; Lizzio et al., 2002). Affective measures could be students’ reflections on their learning, for example, satisfaction with their learning experiences (Biggs, 2003; Biggs & Moore, 1993; Lizzio et al., 2002).

According to the 3P model, student learning outcomes (product factors) are directly influenced by student characteristics and teaching context (presage factors) and the learning approaches students adopted (process factors) (Biggs, 2003; Biggs & Moore, 1993). Process factors also play a mediating role between presage and product factors which deliver an indirect influence from presage factors to product factors (Biggs, 2003; Biggs & Moore, 1993).

### 3.5.4 The interactive system of the 3P model

The developers of the 3P model suggested that the relationships between these factors may be systemic rather than linear (Biggs, 2003; Biggs & Moore, 1993). The most recent version of the 3P model (Biggs, 2003) suggests that student learning can be viewed as an interactive and dynamic system. Biggs (2003) believes the various parts of the model are independently constituted, and are in continuous interaction with one another. That is, this model does not describe a causal process but a continuously interactive system, which implies that any change in one factor will cause changes in another area of the model. For example, students’ experiences with their learning outcomes might change their perceptions of the learning environment or their personal interest in subjects, which in turn
may affect their approaches to learning and subsequent outcomes.

Trigwell and Prosser (1997), on the other hand, argued that the components in the 3P model should not be seen as constituted independently of one another. Instead, the individuals (students) and the world (the environment) are related through the individuals’ awareness of the learning situation around them (Trigwell & Prosser, 1997; Prosser & Trigwell, 1999). Such internal relationships between students and the environment may be difficult to present in the model, however, should be acknowledged. Therefore, Prosser and Trigwell (1999) argued that the components in the 3P model, in terms of perceptions, approaches and outcomes, should be seen as simultaneously present in the students’ awareness for analytical and heuristic purposes, rather than as independently constituted parts of student learning.

### 3.5.5 Previous research using the 3P Model

Six published studies were identified from the literature in which the 3P model was used as the research framework. Four of them were conducted in higher education institutions (Drew & Watkins, 1998; Hall, Bolen, & Gupton, 1995; Lizzio et al., 2002; Zhang, 2000) and two were in high schools (Dart et al., 2000; Wong & Watkins, 1998).

With respect to the four studies undertaken in higher education settings (see Table 3.3), researchers have examined a range of presage factors including students’ prior academic ability (Hall et al., 1995; Lizzio et al., 2000), self-concept (Drew & Watkins, 1998) and perceptions of the learning environment (Lizzio et al., 2000). The process factors in these studies are
represented by students’ approaches to learning. The product factors are generally represented by quantitative learning outcomes, such as academic results measured by marks, grade-point-average (GPA) or other equivalent measures. One study also measured affective and qualitative learning outcomes of students, such as course satisfaction and the development of generic skills (Lizzio et al., 2000). No research has examined the development of SDL readiness as a learning outcome.
Table 3.3: Comparison of previous research undertaken on the 3P model of teaching and learning

<table>
<thead>
<tr>
<th>Researchers (Year)</th>
<th>Presage variables (Measures)</th>
<th>Process variables (Measures)</th>
<th>Product variables</th>
<th>Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall, Bolen &amp; Gupton (1995)</td>
<td>SAT score</td>
<td>Learning approaches (SPQ)</td>
<td>GPA</td>
<td>532 students in a US university</td>
</tr>
<tr>
<td>Drew &amp; Watkins (1998)</td>
<td>Locus of control Academic self-concept</td>
<td>Learning approaches (SPQ)</td>
<td>Standardised overall end of year results</td>
<td>162 students in a Hong Kong university</td>
</tr>
<tr>
<td>Zhang (2000)</td>
<td>Student age, gender, SES, travel and working experiences</td>
<td>Learning approaches (SPQ)</td>
<td>GPA / academic scores</td>
<td>Hong Kong (n = 652), China (n = 193) and United States (n = 67)</td>
</tr>
<tr>
<td>Lizzio, Wilson &amp; Simons (2002)</td>
<td>Tertiary Entry (TE) score Teaching environment (CEQ)</td>
<td>Learning approaches (ASI)</td>
<td>GPA Course satisfaction Generic skills</td>
<td>2130 student in an Australia university</td>
</tr>
</tbody>
</table>

Note: SAT= Scholastic Aptitude Tests; SPQ= Study Process Questionnaire; GPA= Grade Point Average; CEQ= Course Experience Questionnaire; ASI= Approaches to Studying Inventory
Drew and Watkins (1998) used path analysis within structural equation modelling (SEM) to investigate their proposed model. Based on the 3P framework, their model hypothesised that students’ locus of control and academic self-concept (presage factors) affect the adoption of learning approaches (process factors) and subsequently influence their academic achievement (product factor). Data were collected from 162 first-year full-time students across four disciplines (nursing, radiography, and language and communication) in a Hong Kong university. Results showed that students’ locus of control was significantly but negatively related to the use of surface learning approaches, while academic self-concept had a positive and significant influence on the use of deep approaches to learning. Both deep and surface learning approaches were significant predictors of academic achievement: students who reported higher scores on deep approaches to learning were likely to have better academic performance, while those who reported higher scores on surface approaches to learning often received lower academic scores. Results of this study suggested that the 3P framework is useful for illustrating factors influencing students’ learning outcomes. However, this study only chose student characteristics (locus of control and self-concept) as presage factors. Issues of how the teaching context influenced student learning were not addressed.

Zhang (2000) proposed students’ characteristics (age, gender, SES, and travel and working experience) as presage factors, learning approaches as process factors and academic achievement as the product factor. Data were collected from three samples of university students in Hong Kong (n=652), mainland China (n=193), and the United States (n=67). Results from this study suggested that participants across three samples who had travel or
work experiences were more likely to use deep learning approaches. The U.S. and Chinese students who used deep learning approaches were more likely to have higher GPA/academic scores. The results from the Hong Kong sample revealed mixed findings regarding the relationship between learning approaches and academic achievement for specific subjects. For example, students’ use of surface approaches to learning significantly contributed to better academic performance in chemistry and geography, while the use of deep learning approaches significantly contributed to higher achievement in applied mathematics and history.

The mixed findings from Zhang’s (2000) study of Hong Kong university students suggested that students’ use of surface learning approaches may be associated with academic success for some subjects. This result seems to contradict the assumptions and findings that surface learning leads to poor outcomes (Biggs, 2003; Drew & Watkins, 1998; Marton & Saljo, 1976a), however, it needs to be interpreted with caution. Some researchers have suggested that when student learning outcomes are assessed by exams which test facts and knowledge straight from the textbooks or teaching materials, the use of surface learning strategies may result in better academic scores (Scouller, 1998; Trigwell & Prosser, 1991). Zhang (2000) did not provide possible explanations nor explore the association of surface approaches and academic success in any detail in the study.

Lizzio et al. (2002) chose students’ prior academic ability and perceptions of the learning environment as presage factors; approaches to learning as process factors; and academic achievement, course satisfaction and generic skills as product factors in their model. Multiple regression and SEM were
performed to investigate the relationship between the three sets of factors. Questionnaires were distributed to over 5000 students across 14 faculties in an Australia university. A total of 2130 useable responses were obtained. Data were analysed at the faculty level and the university level. The overall results of university level analysis suggested that students’ Tertiary Entrance (TE) score was positively, but weakly associated with surface approaches to learning and their academic achievement at university (measured by GPA). Students’ perceptions of a supportive learning environment were positively associated with their use of deep learning approaches. Such perceptions also significantly and positively influenced students’ learning outcomes of academic achievement, course satisfaction and development of generic skills. Lizzio and associate’s (2002) study provided a thorough analysis of student learning based on the 3P framework, however, the sample from one university may limit the generalisability of results.

Results of these studies may provide empirical evidence supporting that the 3P model has potential as a framework in illustrating the interaction of factors influencing students’ learning outcomes. However, they also raise issues related to the strengths and limitations of research based on the 3P framework. Firstly, these studies were undertaken on samples of Australian, U.S., Chinese and Hong Kong students, suggesting the 3P model may be applied to cross-cultural groups. Secondly, as the potential range of variables associated with the 3P model is broad, researchers may select factors which are of interest to them. However, researchers need to exercise caution in selecting factors that are theoretically justified. That is, they need to ascertain the theoretical basis of proposed factors within the presage, process and product components and to select appropriate measures for
these factors before undertaking empirical work using this framework. The flexibility for individual researchers to choose factors within the 3P framework can become a limitation of research. The researcher may find it difficult to compare research findings with previous studies due to the unique combination of 3P factors in individual studies. In addition, as previously argued, results of testing the 3P framework may not be able to represent the learning patterns across all groups of students.

3.5.6 Adoption of the 3P model

The focus of the present study is to investigate factors influencing the development of student SDL readiness. It has been argued that students’ self-direction in learning is an outcome of the interaction between their personal characteristics and the learning environment (Candy, 1991; Guglielmino & Guglielmino, 1991). A number of writers argue that students’ self-direction in learning is associated with their motivation (e.g., Brookfield, 1986; Garrison, 1997; Regan, 2003) and teachers’ facilitation strategies (e.g., Knowles, 1990; Grow, 1991). These propositions are consistent with those included in the 3P model.

In addition, a review of the literature in Chapter Two revealed that previous SDL research in nursing mainly focused on the effectiveness of using different learning activities (e.g., SDL modules or PBL programs). An explanation of how students’ SDL readiness can be influenced by their personal and environmental factors was not found in the literature. However, as empirical research has suggested that the 3P model is a valid model for illustrating the interaction of factors influencing students’ learning outcomes, it has been adopted to form the conceptual framework for this study’s
investigation of factors influencing students’ development of SDL readiness.

3.6 Conceptual Framework for This Study

The present study proposes students’ achievement goals and their perceptions of the learning environment as presage factors; approaches to learning as process factors; and SDL readiness as the product factor. These key factors and their hypothesised relationships are explained in the following sections. The conceptual framework is presented schematically in Figure 3.6.

Figure 3.6: Conceptual framework for this study (Adopted from Biggs, 2003)

Presage factors          Process factors          Product factors

Student motivation
♦ Mastery goal
♦ Performance goal

Perceptions of learning environment
♦ Good teaching
♦ Clear goals
♦ Appropriate workload
♦ Appropriate assessment
♦ Emphasis on independence

Approaches to learning
Deep approach
Surface approach

SDL readiness

3.6.1 Presage factors

3.6.1.1 Student motivation – achievement goals

In the most recent version of the 3P model, Biggs (2003) suggested three
types of student characteristics may influence learning approaches and outcomes: prior knowledge, ability, and motivation. Prior knowledge and ability, often assessed by university entry scores, has consistently shown little influence on students’ learning approaches and learning outcomes in the university (Hall et al., 1995; Lizzio et al., 2002; Prosser & Trigwell, 1999), whereas students’ motivation is believed to be a key factor influence student learning outcomes (Biggs, 2003; Kember et al., 1999). The present study therefore proposed student motivation as one of the factors influencing the development of SDL readiness.

Researchers have suggested that, in the Chinese cultural context, achievement goals seem to be one of the major factors stimulating student learning (Biggs & Watkins, 1996; Kember et al., 1999; Salili et al., 2001). That is, students’ motivation to learn may come from their aims or expected results of learning. There are at least two types of achievement goals that have been described in the literature, mastery and performance goals, which students are likely to adopt while engaging in learning tasks (Archer, 1994; Elliott & Dweck, 1980). These achievement goals are believed to influence students’ thought, effort, and behaviours during the learning process (Archer, 1994; Archer & Schevak, 1998; Karabenick, 2004).

The mastery goal orientation, similar to intrinsic motivation, refers to students’ willingness to learn comes from their interest or curiosity about the learning tasks (Biggs & Moore, 1993; Dweck & Leggett, 1988). Students who adopt a higher mastery goal orientation may find the learning tasks interesting and important, and their goal for learning is to obtain a thorough understanding of the task (Dweck & Leggett, 1988). The performance goal
orientation, like extrinsic motivation, is attributed to students whose reasons for learning are to demonstrate their ability or superiority, and/or to gain approval (Biggs & Moore, 1993; Dweck & Leggett, 1988). Students who endorse a higher performance goal orientation are thought to focus on competing with their peer students, gaining rewards or avoiding unpleasant results such as punishment or embarrassment (Ames & Archer, 1988).

When the concepts of mastery and performance goals were first introduced to learning theories, they were considered to be extreme points on a bipolar continuum from intrinsic to extrinsic (Dweck & Leggett, 1988). Students were thought to adopt either high mastery with low performance goal orientation, or low mastery with high performance goal orientation (Dweck & Leggett, 1988). More recently, researchers suggested that students may endorse different levels of achievement goals, that is, they can be high in both mastery and performance goal orientations, low in both goals, or high in one and low in the other (Archer, 1994; Pintrich, 2000a). For example, a student adopting both mastery and performance goals may work hard with expectations of understanding the learning content as well as performing better than his/her classmates.

Writers of achievement goals theories believed that students’ endorsement of mastery and performance goal orientations may influence their adoption of learning strategies. It is suggested that students with a higher mastery goal orientation may be more likely to use deep learning strategies to enable the understanding, and may subsequently result in better learning outcomes (Ames, 1992; Dweck & Leggett, 1988; Pintrich, 2000b), while students with a higher performance goal orientation may adopt surface learning strategies.
for instant reward (Dweck & Leggett, 1988; Ironsmith, Marva, Harju, & Eppler, 2003).

Associations between student achievement goals and the adoption of learning approaches have been found in empirical studies. Archer (1994) investigated students’ achievement goal orientation and its relationships with learning attitudes, willingness to tackle difficult tasks, and use of effective learning strategies (e.g., self-monitoring, help-seeking). Data were collected from three independent samples of first-year students across two disciplines (education students, n = 356; psychology students, n = 271; education students the following year, n = 266) in an Australian university. Results indicated that students with a higher mastery goal orientation reported higher scores on positive learning attitudes, willingness to choose hard tasks, and more frequent use of self-monitoring learning strategies. Students with a higher performance goal orientation also demonstrated positive learning attitudes and reported use of effective learning strategies, however, the strength of these relationships were not as strong as that with a higher mastery goal orientation.

Archer’s (1994) study further investigated the interaction effect of mastery and performance goal orientation by dividing the sample into four groups: high in both mastery and performance goals; high in mastery but low in performance goals; low in mastery but high in performance goals; and low in both mastery and performance goals. Findings suggested that students who endorsed both high mastery and performance goal orientations did not report significantly higher scores on positive learning attitudes and the use of effective learning strategies than students who only endorsed mastery
goal orientation. This implies that student mastery goal orientation may have a main effect on learning attitudes and strategies, and that the additional high performance goal orientation may not have a significant impact on student learning. This finding contradicted the assumption that students adopting both goals may fare better in learning (Pintrich, 2000a).

Archer’s (1994) study provided a thorough analysis of how achievement goals may impact on students’ positive learning attitudes and effective (deep) learning strategies. Findings of this study suggested that students with a high mastery or performance goal orientation reported higher scores on the use of deep learning strategies. However, this study did not examine relationships between achievement goals and the adoption of surface learning strategies. In addition, the findings may have limited generalisability due to the sample being recruited from one university.

Perrot and fellow researchers (2001) surveyed a sample of 252 students from medical, nursing and pharmacy faculties in a U.S. university to investigate students’ achievement goals and their preferred learning strategies. Results suggested that students with a high mastery goal orientation reported a higher preference for meta-cognitive learning strategies than those with a high performance goal. That is, mastery goal oriented students were more likely to use complex and self-planning learning strategies, such as inter-relating ideas and/or asking for necessary guidance, than performance goal orientated students. These findings are similar to Archer’s (1994) which suggested students’ mastery goal orientation may be related to their adoption of deep learning strategies. However, Perrot et al., (2001) did not further analyse the significance of
relationships between students’ achievement goals and their learning strategies, neither did they test the interaction effect of mastery and performance goals.

The findings of research about achievement goals are consistent with the assumption underpinning theories of student approaches to learning: when students are motivated by their interest to learn and expect themselves to be able to master the knowledge and skills, they are likely to adopt deep learning strategies to enhance their understanding (Biggs, 2003; Biggs & Moore, 1993; Ramsden, 2003). The present study therefore proposes that students’ achievement goal orientation is associated with their adoption of learning approaches. That is, students with a high mastery goal orientation are more likely to adopt deep learning approaches, while students’ endorsement of high performance goal is associated with their adoption of surface learning approaches.

No published research was found investigating the relationship between students’ achievement goals and their SDL readiness. Some researchers have proposed that students’ achievement goals may directly or indirectly influence students’ self-direction in learning. For example, mastery goal oriented students may prefer using self-planning and self-monitoring learning strategies (Archer, 1994; Perrot et al., 2001). Such preferences may encourage students to be independent in learning, which in turn contributes to the development of SDL readiness (Furze & Pearcey, 1999; Garrison, 1997; Regan, 2003). In addition, students with higher mastery goal orientation usually refers to that they are interested in learning tasks. Such interest may lead to deep involvement in the task, which may further
increase students’ sense of control over learning, and enhance their readiness for SDL (Furze & Pearcy, 1999; Garrison, 1997; Regan, 2003). Therefore, the present study proposes that students’ achievement goal orientation is associated with their SDL readiness. That is, students’ endorsement of higher mastery goal orientation is associated with better readiness for SDL.

3.6.1.2 Student perceptions of the learning environment

The second set of presage factors in the 3P model suggested to influence student learning is the teaching context. It is believed that a change in teaching methods may influence students’ learning approaches and outcomes (Biggs & Moore, 1993; Ramsden, 2003). Research findings have supported the existence of a relationship between teachers’ teaching strategies and students’ learning approaches and outcomes (Gow & Kember, 1993; Trigwell & Prosser, 1996; Trigwell, Prosser, & Waterhouse, 1999). However, arguments have been made that learning and teaching transactions are not about how university teachers have designed and structured their teaching, but rather about how students perceive their way of teaching (Prosser & Trigwell, 1999; Ramsden, 1991, 2003). Students may use different strategies of learning depending on their perceptions of the situation. They may exhibit certain skills or competency in one learning situation, but not in another (Prosser & Trigwell, 1999; Ramsden, 2003). Moreover, in the same learning environment, where the context and design of teaching may be the same for all students, students’ perceptions of the learning situations in that context may still be different (Prosser & Trigwell, 1999).
Some researchers have focused on researching students’ perceptions of the learning environment and identified a number of key elements which are considered to be significant to student learning (Entwistle & Ramsden, 1983; Ramsden, 1991, 1997). Entwistle and Ramsden (1983) surveyed university students’ learning experiences and found that students’ perceptions of workload, learning goals of subjects or tasks, and a sense of freedom in learning were influential to their learning. Ramsden (1991) further extended this work and developed the Course Experience Questionnaire (CEQ) identifying five domains of a learning environment which students perceived to be conducive to their learning: good teaching, clear goals and standards, appropriate assessment, appropriate workload and an emphasis on independence.

The CEQ has been used by various researchers to measure student perceptions of their learning environment (Byrne & Flood, 2003; Diseth et al., 2006; Lizzio et al., 2002; Sadlo & Richardson, 2003). Lizzio and associates’ (2002) survey of a large sample of 2130 Australian university students supports the argument that students’ perceptions of their learning environment influence their adoption of particular learning approaches and learning outcomes. These researchers identified four out of five aspects of the university learning environment (good teaching, appropriate assessment, emphasis on independence and clear goals and standards) were significant and positive predictors of students’ use of deep approaches to learning. Two aspects of the university learning environment, appropriate workload and assessment, were negative predictors of a surface approach to learning, indicating when students perceive a heavy workload and/or the assessment procedures are focusing on testing facts, they often reported higher scores
Lizzio and associates (2002) also investigated the relationship between student perceptions of the learning environment and their learning outcomes including GPA, development of generic skills and course satisfaction. Results showed that the five aspects of an academic learning environment were significant and positive predictors of students’ GPA, reported levels of generic skill development and course satisfaction. These findings may imply that students’ positive perceptions of the learning environment are important to their academic performance, development of study skills and satisfaction with learning experiences.

Diseth and fellow researchers (2006) similarly investigated student perceptions of the learning environment and their relationships with students’ learning approaches and outcomes (academic scores). A total of 486 psychology students in a Norwegian university participated in this study. Results suggest that when students perceived their learning environment to be positive, they were more likely to adopt deep learning approaches, and less likely to use surface approaches. Among the five domains of a learning environment, appropriate workload and good teaching were the most significant factors influencing students’ adoption of deep approaches. In addition, students’ positive perceptions of the learning environment were strong predictors of their academic scores. Results from Diseth et al.’s (2006) study, similar to Lizzio et al.’s (2002), highlighted a close relationship may exist between student perceptions of the learning environment and their learning outcomes. However, they did not address issues related to students’ qualitative and affective learning outcomes.
The relationships between students’ perceptions of the learning environment and their adoption of study approaches and learning outcomes may be supported by empirical studies (e.g., Diseth et al., 2006; Lizzio et al., 2002). Limited research was found to examine the relationship between students’ perceptions of the learning environment and their development of SDL readiness. Some SDL writers suggested a number of elements in a learning environment may be encouraging or discouraging to students’ self-direction in learning. For example, a learning climate which provides students opportunities to choose learning topics (Grow, 1991; Nolan & Nolan, 1997a), the use of multi-faceted assessment methods which focus on students’ participation in questioning and discussion (Brookfield, 1986; Grow, 1991; Knowles, 1980), and a learning situation where students learn to take control over the tasks (Candy, 1991; Nolan & Nolan, 1997a) may help the development of student SDL readiness.

In the present study, students’ perceptions of the learning environment are proposed as the second set of presage factors which influence students’ adoption of deep and surface learning approaches and the development of SDL readiness.

### 3.6.2 Process factor—learning approaches

The present study proposed student SDL readiness as a key outcome of student learning. According to Biggs (2003), the learning outcome is determined by both presage and process factors, but it is particularly affected by the process factor, learning approaches. No empirical research was found that has examined the association between students’ learning
approaches and their development of SDL readiness. However, Candy (1991) suggested the existence of this relationship by stressing that encouraging students to engage in deep-level learning enhances the development of their SDL abilities. He argued that SDL learners “should be acquainted with the differences between surface-level and deep-level processing, and should be instructed deliberately in strategies that lead to deep-level learning” (p. 340).

In addition, the concept of SDL emphasises learners’ ability to pursue effective study strategies and self-management skills (Areglado et al., 1996; Candy, 1991). As previously mentioned, Biggs (2003) argued that when students engage in deep approaches to learning, they are often motivated by their personal interest in the topic, or inspired by supportive learning environments, which leads to the adoption of effective study strategies to achieve better understanding of learning tasks. Such abilities to exercise effective learning strategies to achieve desired learning goals may allow students to establish better self-management skills, be more independent in learning, and thereby enhance the development of SDL readiness. In the present study, the relationship between approaches to learning and students’ readiness for SDL is examined.

3.6.3 Summary of the conceptual framework

The conceptual framework for the present study, as presented in Figure 3.6, (p.61) proposed student achievement goals and perceptions of the learning environment as two sets of presage factors, student approaches to learning as process factors, and SDL readiness as the product factor. It is important to note that this conceptual framework presents a linear understanding of
component relationships. Trigwell and Prosser (1997) have argued that the interpretation of interactions in the 3P model should include the idea of ‘temporality’. That is, in any act of teaching and learning, the 3P model does not describe a chain of causal processes extended over time, but a simultaneously present of students’ awareness of the teaching and learning acts in which they are engaged. As such, while this study will seek to test the conceptual framework, the results (presented in Chapter Six) can only represent a linear understanding of participants’ awareness of their learning context at the time the survey was conducted.

The present study intends to identify key variables that may be important to understanding students’ development of SDL readiness. Further studies will be required to examine the interactive relationships between concepts and variables identified as significant in this framework.

3.7 Summary

In this chapter, theoretical perspectives of student approaches to learning, and models of student learning were introduced. It is generally proposed in these learning models that student learning outcomes are influenced by student personal characteristics and their learning environment. Among them, Biggs’ (2003) ‘3P model of teaching and learning’ is deemed by many researchers as a concise model to explain why students learn differently. The 3P model exemplifies how student learning outcomes (product factors) are influenced by presage factors (student characteristics and teaching context) and process factors (learning approaches). The present study therefore adopted this model as a basis to form its conceptual framework.
This chapter then provided descriptions of the conceptual framework for this study. Two sets of presage factors – students’ achievement goal and perceptions of the learning environment; process factors – students’ approaches to learning; and the product factor – student SDL readiness, were proposed in this framework. The hypothesised relationships between these variables were also explained.

The present study aims to use this conceptual framework as a guide to investigate Taiwanese nursing students’ experiences with SDL activities, and explore factors influencing their development of SDL readiness. To achieve these aims, a mixed-methods research design was used. The research methodology and methods are described in the next chapter.
Chapter 4: Methodology

4.1 Introduction

This chapter describes the methodology and methods for the present study. In the first part (Section 4.2), methodological issues associated with the use of a mixed-method design are introduced. The methods for the stage one qualitative study, including the recruitment of participants, interview process, data analysis procedures and strategies for attaining trustworthiness of findings, are described in Section 4.3. The methods for the stage two quantitative study, comprising pilot testing and cross-sectional survey, are then described. Section 4.4 presents the process of instrument pilot testing followed by an account of the cross-sectional survey conducted for this study, including research questions, data collection and analysis procedures. The final section (Section 4.5) addresses ethical issues relevant to this study.

4.2 Research Design

4.2.1 Mixed-method approach

Since the 1950s, quantitative research methods have been commonly employed by nursing researchers. However, during the 1980s, qualitative methodologies gained increasing attention (Creswell, Fetters, & Ivankova, 2004; Sale, Lohfeld, & Brazil, 2002). The quantitative approach is described as an objective, formal, systematic process in which numerical data are used to quantify or measure phenomena and produce findings (Carr, 1994; Shih, 1998; Tashakkori & Teddlie, 2003). Quantitative methodologies typically test theory deductively from existing knowledge, through developing hypothesised relationships and proposed outcomes for the study (Carr, 1994). Such techniques tend to rely on the researcher being a detached,
objective interpreter who controls the external environment and procedures to decrease bias and confounding variables in relation to the study (Carr, 1994; Shih, 1998; Tashakkori & Teddlie, 2003).

Qualitative research typically develops theory inductively through in-depth investigation. Qualitative methodology is commonly described as a vehicle for studying the empirical experience from the perspectives of the subject, not the researcher (Carr, 1994; Shih, 1998; Tashakkori & Toddlie, 2003). Therefore, qualitative research procedures, such as case studies and semi-structured interviews, usually require the involvement of the researcher in natural, non-manipulative settings. The interpretation of specific situations by the researcher might be regarded as somewhat subjective as such situations require interpretation based on personal perceptions and experiences (Carr, 1994).

Over the past decade, there has been an increasing emphasis on combining qualitative and quantitative methods in a single study (Creswell, 2003; Creswell et al., 2004; Tashakkori & Teddlie, 1998, 2003). Sale and associates (2002) summarised researchers’ viewpoints as to why it is appropriate to combine qualitative and quantitative methods. Firstly, the two approaches can be combined because they share the goal of understanding the world and a commitment to improve the human condition by disseminating knowledge for practical use. Secondly, combining research methods can be helpful in researching complex phenomena that require data from different perspectives. As Thurmond (2001) argued, qualitative investigation may help to explain phenomena when the numbers fail to answer the questions, while quantitative data can enhance understanding of
phenomena by generating the findings statistically. As such, two main reasons are commonly given for using the mixed-method approach. The first is to achieve cross-validation or triangulation – combining two or more approaches to study the same phenomenon – and the second is to achieve complementary results by using the strengths of one method to enhance the other (Sale et al., 2002).

However, combining different methodologies within a single study is not unproblematic. From a traditional perspective, qualitative and quantitative methods belong to different paradigms and are viewed as distinct and incompatible (Guba & Lincoln, 2004). Based on their paradigmatic assumptions, some writers argue that the two methods do not study the same phenomena (Morgan, 1998; Sale et al., 2002). That is, while it may be possible that both quantitative and qualitative researchers label phenomena identically, the former labels external referents, the latter labels personal interpretations or meanings attached to phenomena (Sale et al., 2002). Moreover, combining qualitative and quantitative methods is associated with a high degree of complexity. A mixed-method study may require particular researcher expertise in designing and implementing different methods, as well as in analysing data. Time demands and expense may well increase, not only because of the additional data collection and analysis, but also because interpreting and synthesising the data becomes more complex (Polit & Hungler, 1999; Waysman & Savaya, 1997).

Because of these challenges, some researchers suggest studies can combine two methods for complementary purposes when each method studies different phenomena and is independent (Sale et al., 2002). In practical
terms, Morgan (1998) proposed two basic ways in which qualitative and quantitative approaches are usually combined: a qualitative approach is used as a preliminary inquiry in quantitative work, or vice versa. Such a mixed-method design can be carried out simultaneously or sequentially in a single study.

In addition, when skills, time or budget are limited, it is suggested that the researcher make clear decisions about the main epistemological position of the actual research project. This primary method must be rigorous enough to be able to sustain the study by itself, while the added method contributes to the strength of the research (Foss & Ellefsen, 2002; Morse, 1991).

In this study, qualitative and quantitative methods were used sequentially in order to obtain a better understanding of SDL readiness amongst Taiwanese nursing students. The first stage of this research was a qualitative approach using semi-structured interviews to understand nursing student’s experiences with learning activities which they perceived to be self-directed within their undergraduate programs. Findings of this interview study provided a background of Taiwanese nursing students’ learning experiences relating to the research questions and, more importantly, detailed descriptions of factors that students thought to influence outcomes of these perceived SDL activities. The second stage was a quantitative evaluation using a questionnaire survey of nursing students to test the relationships between proposed factors in the conceptual framework (i.e., students’ achievement goals, perceptions of the learning environment, approaches to learning and SDL readiness). Results from this second stage further illustrate how students’ SDL readiness may be influenced by their
motivation and the learning environment. As such, the two methods are used in the present study to complement each other, and provide a more comprehensive account of self-directed learning amongst Taiwanese students.

4.2.2 Research population

The target population for this research consisted of students who were studying full-time in the final year of nursing undergraduate programs in the TVE system (refer to Figure 1.1). Potential participants were studying in two different programs: the 2-year post-college program and the 4-year post-VHS program. These students were selected because the majority of them had studied nursing courses before entering their current undergraduate programs, some of them had acquired nursing licences and soon they would obtain bachelor degrees. Presumably, they had been studying nursing for a number of years, and had sufficient learning experiences from their previous and present nursing programs upon which to draw when responding to study questions. Their experiences and perceptions of the nursing education environment were expected to be more informed than those of junior students for the purpose of the present study.

Five nursing departments in the south region of Taiwan were selected for convenience purposes. These departments represented five of the largest schools in this region. After contacting these five departments, three consented to participate in the study. Permission to survey the students was obtained from the director as well as the research committee of each participating school (Appendix 4.1).
4.3 Stage One — Qualitative Approach

4.3.1 Aims of the study

The stage one study employed a qualitative approach aimed at understanding nursing students’ experiences with learning activities which they perceived to be self-directed in their undergraduate programs. An exploration of students’ perceptions of factors influencing the process and outcome of these learning activities was the main purpose. The specific aims of this study were to:

1. understand undergraduate nursing students’ learning experiences, particularly, their experiences with learning activities which they perceived to be self-directed;
2. explore factors that undergraduate nursing students perceived to influence the outcome of these learning activities; and
3. investigate undergraduate nursing students’ perceived learning outcomes after undertaking these learning activities.

4.3.2 Recruitment of participants

The sample for the stage one study consisted of students who were studying full-time in the final year of the 2-year post-college program and the 4-year post-VHS program. A voluntary sampling strategy was used to recruit participants. A letter of invitation was given to each eligible student through the directors of the three participating nursing departments. A total of 417 invitation letters were given to the directors. Students who were interested in this study could contact the researcher to arrange an appropriate time for interview. The invitation letters were distributed through the director, so the actual number of potential participants who received the letter was uncertain.
In addition, as the time of interviews was scheduled at the end of the semester, and as students were rotating around clinical settings for practicum, a low response rate was anticipated. In total, only eight students were interviewed. Three of them accepted the invitation and made contact with the researcher, the other five participants were recruited through introductions from their teachers or classmates.

Among these eight participants, three were studying in University C, three in University M and two in University T. Five participants were studying in the 2-year program. Among them, student A and F graduated from a 5-year junior college, while student C, G and H completed a 3-year vocational high school study, then a 2-year junior college program. The other three were in the 4-year program. They had entered the current program after completing a 3-year vocational high school study (Figure 4.7).

*Figure 4.7: Interview participants’ nursing education background*
4.3.3 Semi-structured interview

To obtain data from individual learners about their learning experiences, a data collection strategy that involved direct contact with individual learners was essential. Semi-structured interview was chosen as the data collection technique for this stage, as it is deemed the most appropriate way to obtain in-depth information about the experiences of individuals (Creswell, 2003).

A semi-structured interview protocol was developed in accordance with the aims of this study to provide the researcher with focus and a sense of direction during the interviews (Table 4.4). The interview started with questions about participants’ general learning experiences within nursing programs (questions 1 to 3). Questions 4 and 5 focused on their specific experiences with learning activities which they perceived to be self-directed. The term self-directed was not familiar to the participants. The researcher therefore explained the phrase “directed by yourself or your group” (in question 4) to each participant using Knowles’s (1975) definition — to be self-directed means to take responsibility for deciding one’s own learning needs and goals, identifying learning resources, implementing learning strategies and/or evaluating learning outcomes. The interview then focused on students’ experiences of these activities within nursing subjects. Participants were asked to recall positive and negative experiences with these learning activities, and to give examples of situations which had facilitated or hindered the process and outcome of the activities (questions 6 and 7). The final two questions (question 8 and 9) required participants to reflect on their overall experiences with these learning activities and to describe their perceived learning outcomes after undertaking these activities.
Probing questions associated with the key questions were asked to explore issues in more depth where required. If participants hesitated to answer, the researcher showed respect for the participants’ decision by terminating or discontinuing discussion of the issue.

Table 4.4: Interview questions for the stage one study

1. Tell me why did you choose to study in nursing?
2. What makes you want to pursue undergraduate study?
3. What are your learning experiences with the current and the previous nursing programs?
4. Within these 2 (or 4) years of undergraduate study, have you ever participated in learning activities that were directed by yourself or your group? Tell me about them?
5. What aspects in these activities were directed by you (or your group)? Learning needs? Topics? Learning goals? Study plan? Evaluation process?
6. Think of one of these activities that you thought you had a positive experience with, what was it? Describe how you went through this activity? How do you feel about the procedures?
7. Now think of another of these learning activities that you thought you had a negative experience with, what was it? Describe how you undertook this activity? How do you feel about the procedures?
8. Overall, how do you feel about these learning activities?
9. In general, what have you learned from these activities?

Each interview lasted from 45 minutes to just over one hour, and was carried out at a time and place agreed upon by both the researcher and the interviewee. The interviews were conducted in Chinese and audio-taped. Prior to the interview, every effort was made to establish a relaxed and friendly climate in order to enhance the conversation. The interview started with an explanation of the research purposes and the importance of interviewees’ participation. Participants were given an information sheet and
informed that the interview would be tape-recorded, and the information they provided would be used for research purposes only. Confidentiality, their anonymity and right to withdraw at any time were also guaranteed. They were then given time to ask questions about the interview or the study, and to complete the Informed Consent form (Appendix 4.2).

During the interview, students were encouraged to think deeply and critically about the experiences they have had of the teaching and learning process in the university, especially in relation to learning activities. Participants described their learning environments in both positive and negative ways. It was important for the researcher to remain open-minded and neutral no matter what the participants discussed. Each question from the interview protocol was asked, and related probing questions were used for clarification or further explanation of participants’ responses when necessary. The researcher also wrote down information and reflective notes to record significant incidents or ideas emerging during the conversation. Some of these notes led to modifications of interview questions. For example, the interview question “what are your motivations to study the nursing undergraduate program?” was modified to “what makes you want to pursue undergraduate study?” because the term motivation appeared to be confusing to some participants.

4.3.4 Interview data analysis

The literature suggests there is no single correct method for analysing qualitative data, rather, the course of action chosen must reflect the purposes of the study (Graneheim & Lundman, 2004; Jacelon & O'Dell, 2005). In this study, the interview protocol was structured according to the research aims
and the conceptual framework. This framework thus also influenced the approach to data analysis. The analysis procedure began with a deductive approach using the research aims to form three main concepts as an analytic framework for reviewing the transcripts. In particular, factors proposed to influence student SDL readiness in the conceptual framework were used as a reference to identify issues relating to students’ perceptions of factors influence the outcome of their perceived SDL activities. Inductive methods were then used to generate codes and categories from the data relating to three main study concepts. The steps of data analysis and related examples are described below.

**Step one: data preparation**

Each interview was transcribed verbatim by the researcher and rechecked against the tape for word-by-word accuracy. Changes in the participants’ voice or significant pauses were recorded and commented on in writing on the transcripts.

**Step two: data conceptualisation**

The research aims form the three main concepts of the results: experiences of studying in nursing programs; factors influencing the outcome of student perceived SDL activities; and perceived learning outcomes after undertaking these learning activities. Using these concepts as a frame of reference, transcripts were read and re-read to achieve familiarity of the emergent patterns relevant to these concepts.

**Step three: code generation**

Two transcripts which the researcher found rich in information were
selected to establish a tentative coding system. These two transcripts were coded separately. Each transcript was broken down into units of meaning, and each unit of meaning was given a code. The units of meaning here could be segments of sentences or paragraphs related to the three concepts identified in the previous step. The codes given to these units were a brief summary of the unit, often taken from the actual language of the participants \textit{(in vivo codes)}. Codes generated from the data were listed under their respective concepts. For example, in Table 4.5, codes under the first concept ‘experiences of studying in nursing programs’ include duck-feeding, exam-oriented, memorising and so forth.

\textbf{Step four: code categorisation (list of categories and codes)}

When units of meaning were coded, the codes were compared based on differences and similarities and were further grouped into categories. The category refers to a descriptive level of content representing a group of codes. It can be seen as an expression of the manifest content of the text (Graneheim & Lundman, 2004). A category often includes a number of sub-categories. The sub-categories can be sorted into a category, or a category can be divided into sub-categories. For instance, codes of participants’ experiences of teaching styles in their previous nursing programs, such as ‘duck-feeding’, ‘exam-orientated’, ‘read through text books’ (see Table 4.5) were grouped into a sub-category ‘teaching styles in the previous program’. The rest of the codes were grouped into their respective sub-categories, including ‘teaching styles in the present program’, ‘learning styles in the previous program’ and ‘learning styles in the present program’. The sub-categories were further merged into categories. As exemplified in Table 4.5, the sub-categories of ‘teaching styles in the
previous program’ and ‘teaching styles in the present program’ were sorted into a category ‘from “duck-feeding” to innovative teaching’; ‘learning styles in the previous program’ and ‘learning styles in the present program’ were grouped into category ‘from passive to active learning’.

The researcher then re-read the two selected transcripts alongside the category list to ensure the codes and categories covered all aspects of the interviews. This tentative coding list and supporting quotes were translated into English and discussed with supervisors. Following the discussion, modifications to coding lists were made until consensus was reached by the researcher and her supervisor.

**Step five: coding each transcript**

The other six transcripts were then coded according to the categorised lists of codes. Through this coding process, new codes were continuously discovered. These new codes were evaluated to decide whether they should be added to the code lists and under which category or new categories were required. These codes with supporting quotes were also translated into English and presented in the meetings with supervisors. Again, ongoing modifications were made until consensus was reached by the researcher and her supervisor.
Table 4.5: An example of a coding system for the first concept: Experiences of studying in nursing programs (codes, sub-categories, categories and theme from data analysis)

<table>
<thead>
<tr>
<th>Theme</th>
<th>A shift of teaching and learning style</th>
<th>From passive to active learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Categories</td>
<td>From ‘duck-feeding’ to innovative teaching</td>
<td>From passive to active learning</td>
</tr>
<tr>
<td>Sub-categories</td>
<td>Teaching style - previous</td>
<td>Teaching style - present</td>
</tr>
<tr>
<td>Codes</td>
<td>• Duck-feeding</td>
<td>• Computer-assisted teaching</td>
</tr>
<tr>
<td></td>
<td>• Exam-orientated</td>
<td>• Guidance-oriented</td>
</tr>
<tr>
<td></td>
<td>• Read through text books</td>
<td>• Critical thinking strategies</td>
</tr>
<tr>
<td></td>
<td>• Highlight exam content</td>
<td>• Concept mapping strategies</td>
</tr>
<tr>
<td></td>
<td>• Give away exam questions</td>
<td>• Student-directed activities</td>
</tr>
<tr>
<td></td>
<td>• Lecturing</td>
<td>• Encourage discussion in class</td>
</tr>
<tr>
<td></td>
<td>• Tests, tests and more tests</td>
<td></td>
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<tr>
<td></td>
<td></td>
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</tbody>
</table>
Step six: code and category revision

Throughout the analysis procedure, the codes and categories were constantly under revision. The researcher kept research memos to record emerging questions, thoughts and ideas when reading and coding the transcripts. For example, in the interview, student A and several other participants asserted: “Teachers should not dump these activities on us; they should be responsible for them too!” The researcher reflected on this statement and wrote down questions such as “What did they mean by ‘teachers should be responsible’? Did they mean teachers should demonstrate a strong commitment to teaching, or provide help as soon as students asked?” These reflective notes and questions were further clarified and defined by in-depth analysis of all transcripts. The revisions of the categorised code list and the researcher’s constant reflections on the data became a process of reciprocity. The code lists evolved as the researcher obtained better understandings of the interview data by writing reports and having discussions with the supervisor. Finally, themes were generated to describe their respective group of categories. Results of the analyses are presented in the next chapter.

4.3.5 Issues of translation

One issue that needs to be addressed regarding the analysis process is translation of interview data. The interviews were conducted and transcribed in Chinese. As stated in the previous section, the categorised code lists and supporting quotes from the transcripts were translated into English to enable discussions with supervisors. Twinn (1997) raised two major issues in relation to the complexity of translating qualitative data from Chinese to English. The first issue relates to use of more than one translator, resulting
in inconsistencies within the translated text. The second issue relates to the translation of words for which there is no true equivalent within the source language.

In order to minimise these influences of translation on this study’s data analysis, the researcher was the sole translator. When translating Chinese terms that had no apparent English equivalent, the researcher carefully chose the words with the closest meaning so as to maintain accuracy of the text. The researcher also consulted a language advisor at QUT to ensure the translated narratives faithfully reproduced the meanings of the original transcripts. For example, one participant used the expression “wandering around like headless flies” to describe themselves busily looking for a suitable study topic without a clear direction from the teacher. The advisor suggested an equivalent analogy in English: ‘running around like a headless chook’. However, it was agreed to keep the original description because the expression of “headless flies” was considered easy for the readers to understand.

4.3.6 Trustworthiness of the findings

To achieve trustworthiness of findings from qualitative data, the analysis procedure used to generate the categories must be monitored. When considering trustworthiness in qualitative research, some writers applied concepts typically used in quantitative studies, such as validity, reliability and generalisability (Burnard, 1991; Creswell, 2003). However, other authors assert that credibility, transferability, dependability and confirmability are more appropriate to represent the different aspects of trustworthiness in qualitative findings (Graneheim & Lundman, 2004; Guba
& Lincoln, 2004; Polit & Hungler, 1999; Tobin & Begley, 2004). Some researchers have suggested that these aspects of trustworthiness in a qualitative study can be achieved by appropriate checking methods; these are summarised in Table 4.6 (Creswell, 2003; Graneheim & Lundman, 2004; Guba & Lincoln, 2004; Tobin & Begley, 2004).

**Table 4.6: Methods for checking trustworthiness in qualitative research**

<table>
<thead>
<tr>
<th>Aspects of Trustworthiness</th>
<th>Suggested strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Credibility</td>
<td>member checks, peer debriefing, audit trails, participant checks, prolong engagement</td>
</tr>
<tr>
<td>Transferability</td>
<td>rich presentation of the findings</td>
</tr>
<tr>
<td>Dependability</td>
<td>audit trails, clear documentation</td>
</tr>
<tr>
<td>Confirmability</td>
<td>audit trails, participant checks</td>
</tr>
</tbody>
</table>

Credibility of the findings addresses the issues of how well the generated categories and themes explain the data, that is, how accurately the findings represent and cover participants’ points of view (Graneheim & Lundman, 2004; Guba & Lincoln, 2004; Tobin & Begley, 2004). In this study, credibility of the findings was monitored through discussions with the PhD supervisor, fellow PhD students and participant checks. Firstly, the researcher’s principal supervisor critically examined categorised code lists and provided comments on each written draft. While the coding process was undertaken by the researcher in Chinese, several supporting quotes to each code was translated by the researcher into English to facilitate discussion with the supervisor. The interpretation of data was discussed at meetings, which enhanced the researcher’s understanding of data and brought revisions to the code lists. The discussions with the supervisor allowed
in-depth understanding of the data, and brought ongoing refinements of codes, which enhanced credibility of the findings.

Secondly, the researcher sought opinions of two PhD students, who are experienced nurse educators in Taiwan, during the analysis procedure to enhance credibility of the findings. The category list and quotes were presented both in Chinese and in English and discussed between the researcher and these two PhD colleagues to improve the accuracy and objectivity of the findings. The researcher held regular discussions with them by phone and face to face meetings. Numerous questions were raised and discussed during these discussions. For instance, they asked if the participants were more likely to be self-directed in nature because of the recruitment strategies (voluntary participation). If it was the case, the interview findings were likely to represent opinions from active students. This comment brought the researcher to review and interpret the data with a different insight.

Thirdly, when the final categorised code list was ready, the researcher conducted participant checks to achieve credibility. Two participants were invited to read through their own transcripts in conjunction with an additional document listing categories and supporting quotes (from their own interview transcripts). They later gave the researcher feedback confirming that these categories appropriately covered and described their opinions.

Transferability is similar to the concept of generalisability. It refers to the extent to which the findings can be transferred to a similar setting or group
Researchers argued that such generalisability plays a minor role in qualitative inquiry because there is no single ‘true’ interpretation in the naturalistic paradigm (Creswell, 2003). It is less likely the findings from one qualitative study can be transferred to another (Creswell, 2003; Tobin & Begley, 2004). While the findings from the qualitative phase of the present study are not argued to be representative of all students, the researcher has attempted to recruit students whose views are likely to broadly reflect those of their peers.

Dependability refers to the consistency of data collection and analysis procedures (Graneheim & Lundman, 2004; Tobin & Begley, 2004). Qualitative research procedures are often an evolving process, in which the interviewers may acquire new insight over time and this may influence the focus of following interviews and analysis. Some writers suggest that dependability can be achieved through a process of open dialogue within the research team and audit trails to ensure the analysis procedure is consistent, logical, traceable and clearly documented (Graneheim & Lundman, 2004; Tobin & Begley, 2004). In this study, dependability of the findings was facilitated by regular discussions with the supervisor and the two bilingual PhD colleagues. In addition, the analysis procedure and continuous revision of codes and categories were well documented, which provided a clear trail of changes and alterations made during the analysis process. Findings were also presented at a conference (Appendix 4.3) with clear descriptions of each category and supporting quotes to encourage discussions with the audience.
Confirmability ensures “the establishment of data and interpretations of the findings are not figments of the researcher’s imagination but are clearly derived from the data” (Tobin & Begley, 2004, p.392). In this study, confirmability of the findings was facilitated by clear documentation of interview transcripts, analysis procedure and revisions of codes and categories. In addition, participant checks were also used to confirm the interpretation of data is close to participants’ opinions. As described previously, two participants confirmed that the findings appropriately represented their opinions.

4.4 Stage Two — Quantitative Approach

Results of the stage one study provided descriptions of Taiwanese nursing students’ experience with learning activities which they perceived to be self-directed in the undergraduate program. The stage two study aimed to test the relationships between the proposed factors within the conceptual framework. This stage consisted of two phases: instrument pilot testing and cross-sectional survey.

4.4.1 Phase one — instrument pilot testing

4.4.1.1 Sample for the pilot test

The pilot test was conducted with a convenience sample of the second-year students in a 4-year program at one of the participating nursing departments. These students were not the target for the main survey, as the main survey sample comprised nursing students in their final year of undergraduate study. The survey was distributed on two occasions one week apart to enable assessment of test re-test reliability. A total of 118 surveys were distributed to the students and 81 questionnaires were returned (response rate of 69%).
Chapter 4

The second round of questionnaires, each set accompanied by a self-stamped envelope addressed to the researcher, was sent to the student sample one week after the first distribution. Recipients were asked to return the questionnaires in two weeks. Follow-up letters were sent to encourage responses. Only 40 students returned the second questionnaires within the given time (response rate of 34% of the original sample and 49% of those who responded to the first round test).

4.4.1.2 Instrument selection

Based on this study’s conceptual framework, some validated instruments were found to be suitable to measure the proposed factors. After comparing these instruments, four sets of scales were selected for this study’s investigation: the Mastery, Performance and Alienation Goal Scale; the Course Experience Questionnaire (CEQ); the revised two-factor Study Process Questionnaire (R-SPQ-2F); and the Self-directed Learning Readiness Scale for nurses (SDLRS). Permissions to use these instruments were obtained from the authors (Appendix 4.4).

Student achievement goals: the Mastery, Performance and Alienation Goal Scales

The achievement goal theory has been widely used to provide a framework to understand students’ motivation and their subsequent learning outcomes at school and university levels (Archer, 1994; Gano-Overway & Ewing, 2004; Ironsmith et al., 2003). Various instruments based on this theory have been developed for different populations, such as sports persons or primary and high school students (Jagacinski & Duda, 2001).
In the present study, students’ motivation to learn and to accomplish learning tasks was measured by the Mastery, Performance and Alienation Goal Scales (Archer, 1994). This scale, consisting of three subscales, measures the achievement goal orientations of university students. The Mastery Goal scale estimates the strength of students’ intrinsic interests in studying. The Performance Goal scale measures the extent to which the academic performances and social rewards orient students to learn. The Alienation Goal scale reflects the motivation of students who exercise little effort on study not because they lack ability, but because their interests and sources of self-esteem lie outside the classroom (Archer, 1994). These scales are scored on a 5-point Likert scale, ranging from 1 (strongly disagree/very unsatisfied) to 5 (strongly agree/very satisfied), and consist of a total of 20 items. The Cronbach’s alpha values were 0.84 for the Mastery Goal scale (n=8), 0.80 for the Performance Goal scale (n=8), and 0.70 for the Alienation Goal scale (n=4), based on a test of 627 university students in Australia (Archer, 1994).

Perceptions of the learning environment: the Course Experience Questionnaire (CEQ)

The Course Experience Questionnaire (CEQ) was developed by Ramsden (1991) for the purpose of using student ratings to derive performance indicators of teaching effectiveness in higher education institutions. Since 1993, the CEQ has been commonly used to probe the key elements of the university learning process and obtain data on the quality of teaching and courses both worldwide and in Australia (Diseth et al., 2006; Espeland & Indrehus, 2003). While it has often been described as a ‘student satisfaction survey’, Ramsden (1998) argued that this instrument “was designed to do
more than this” (p. 25). Griffin and associates (2003) believed that the outputs of CEQ evaluation are intended to assist institutions with their quality enhancement and improvement of curriculum design. Such analysis of students’ feedback may also provide valuable information to institutions on the benefits and constraints of particular courses.

The original CEQ contains 30 items with five subscales measuring key aspects of the learning environment: clear goals and standards; good teaching; emphasis on independence; appropriate workload; and appropriate assessment (Ramsden, 1991). The scale is scored on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). This instrument has undergone rigorous testing for reliability and validity. In Ramsden’s (1991) pilot test based on a sample of 3372 university students from 13 Australian universities, Cronbach’s alpha values for five subscales were at satisfactory level (ranging from 0.71 to 0.87). Wilson and colleagues (1997) further examined the validity and reliability of the CEQ using data from a large multidisciplinary sample of Australian university students and graduates. Using SEM techniques, results of exploratory and confirmatory factor analysis confirmed the five factors (or subscales) of the CEQ, suggesting good construct validity (model fit index CFI=0.85, RMS=0.04) of the scale. Reliability coefficients for five subscales, ranging from 0.70 to 0.88, were again at satisfactory levels.
Approaches to learning: the revised two-factor Study Process Questionnaire (R-SPQ-2F)

The Study Process Questionnaire (SPQ) was developed by Biggs (1987) based on the concept of student approaches to learning. The original SPQ contained three scales: surface, deep and achieving approaches. This instrument has been used in many educational studies (Evans et al., 2003; Snelgrove, 2004). However, results of a factor analysis study suggested that the items on the ‘achieving’ scale were aligning themselves on deep or surface scales (Kember & Leung, 1998). Some researchers have therefore suggested that the achieving scale may not be as reliable as the deep and surface scales when monitoring student approaches to learning (Biggs, Kember, & Leung, 2001; Kember & Leung, 1998).

The SPQ was therefore revised to a two-factor version which consists of 20 items reflecting learning motives and strategies of university students (Biggs, Kember & Leung, 2001). Students were asked to indicate how often they adopt a certain learning strategy by rating a 5-point Likert scale from 1 (never) to 5 (always). The revised two-factor Study Process Questionnaire (R-SPQ-2F) was first tested on a total of 229 university students in Hong Kong. Confirmatory factor analysis confirmed that the questionnaire consists of two sub-scales: Deep Approach and Surface Approach. The questionnaire was further tested on a sample of 495 undergraduate students from various disciplines of a university in Hong Kong. Cronbach’s alpha values for the deep approach and surface approach scales were 0.73 and 0.64, respectively (Biggs, Kember & Leung, 2001). Confirmatory factor analysis using SEM technique further suggested good construct validity of the R-SPQ-2F (model fit index CFI = 0.992, SRMR = 0.015).
Leung and Chan (2001) translated the R-SPQ-2F into Chinese and administered the questionnaire to 176 education students in a Hong Kong university. Reliability coefficients suggested this Chinese version questionnaire were at satisfactory levels, with the alpha value of the Deep Approach scale being 0.76 and the Surface Approach scale being 0.78. Furthermore, confirmatory factor analysis (SEM) showed a moderate fit of the model (model fit index GFI = 0.83, RMS = 0.08).

**SDL readiness: SDL Readiness Scale (SDLRS) for nurses**

Students’ self-direction in learning is seen by many writers as an outcome of education (Brockett & Hiemstra, 1991; Candy, 1991; Grow, 1991; Knowles, 1990). It is proposed as the product factor in this study’s conceptual framework. Quantitative methods to measure such educational outcome have been discussed. Some researchers have argued that learners’ ‘self-direction’ can not be measured directly, but the learner’s attributes associated with self-direction in learning, in terms of attitudes, values, beliefs, and abilities, can be directly measured (Fisher et al., 2001; Guglielmino, 1977; Owen, 1999). It is believed that these attributes determine whether or not self-direction will take place in a learning situation and how the learning process will be managed (Candy, 1991; Fisher et al., 2001; Guglielmino, 1977).

To measure these attributes, Fisher et al., (2001) reviewed the relevant literature and developed a SDL Readiness Scale targeted at nursing students and nurses to assess the extent to which students perceive themselves to possess these attributes. This instrument was designed through the Delphi
technique with a panel of 11 nurse educators who had research and teaching experience in the area of SDL. The panel was invited to assess the content and construct validity for a number of items reflecting nursing students’ SDL readiness. The selected items were organised and then administered to a convenience sample of 201 undergraduate nursing students. Exploratory factor analysis revealed three subscales: Self-management; Desire for Learning; and Self-control. This scale is scored on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree), and contains 40 items. Cronbach’s alpha coefficients for the Self-management subscale (n=13), the Desire for Learning subscale (n=12), and the Self-control subscale (n=15) were 0.86, 0.85 and 0.83, respectively.

4.4.1.3 Instrument translation

The selected instruments were translated into Chinese using a back-translation approach and then verified through strategies suggested by cross-cultural research experts (Chang, Chau, & Holroyd, 1999; Jones, Lee, Phillips, Zhang, & Jaceldo, 2001; Maneesriwongul & Dixon, 2004). Firstly, a professional translator from a translation service in Taiwan conducted forward translation (from the English version to the Chinese version). Due to the differences of cultural context and education systems, the first draft of the translated version had some issues which need to be resolved. For example, the term ‘course’ represents ‘a series of subjects or lessons’ in Australia, whereas it is equivalent to ‘a subject’ in Taiwan. The researcher held discussions with the translator and went through each item. Necessary changes, such as selecting words with closest meaning and ensuring consistency of terms throughout the questionnaire, were made based on mutual agreement.
Secondly, the researcher asked two bilingual PhD students to examine the appropriateness of wordings and the congruence of conceptual meanings between the English and Chinese versions of the questionnaires. Two nurse educators and two undergraduate nursing students in Taiwan were then invited to check the clarity and adequacy of wordings in the Chinese questionnaires. Feedback from these reviewers was considered and discussed. A few minor changes were made accordingly.

Finally, a professional translator from a different translation company was asked to conduct back-translation (from the Chinese version back to the English version). The original and back-translated versions of questionnaires demonstrated a satisfactory level of equivalence (Appendix 4.5). The Chinese version of the set of questionnaires was thus finalised and ready for pilot testing.

4.4.1.4 Data collection

Before conducting the pilot test, minor modification was made to the CEQ scale based on findings from the stage one study. That is, the interview results suggested that participants appeared to be concerned that the inadequacy of learning resources may have influenced their learning process. An additional subscale ‘Learning Resources’ was therefore developed to measure the accessibility and availability of learning resources in a learning environment. This subscale comprises six items whose descriptions are based on participants’ statements to maintain content validity (See Appendix 4.5)
The set of four questionnaires with an information sheet was distributed to each student of this sample at the end of a class. Prior to administering the questionnaires, the researcher explained the purpose of the study to students and invited them to seek clarification about the research if they had any queries. Confidentiality of the responses and participant anonymity was assured.

In order to correlate the first and second rounds of questionnaires, each participant was given an identification number. Each number was an adaptation of the participant’s answers to a series of questions, such as place of birth, month of birth and blood types. This coding system was used by the researcher to prevent the possibility of revealing participants’ personal identity. Data from the pilot testing were analysed to test for internal consistency. Paired-sample t-tests, correlation tests and Bland-Altman plot analysis were also used to evaluate the reliability and stability of instruments (Bland & Altman, 1999; Hair, Black, Babin, Anderson, & Tatham, 2006).

4.4.2 Phase two – Cross-sectional survey

4.4.2.1 Aims of this survey

Once the reliability of the translated instruments was confirmed, the questionnaires were administered to the target sample. This sample included 422 nursing students in their final year of undergraduate study from the three participating departments. Data collected from this survey were used to examine the relationships between variables in the conceptual framework. The conceptual framework suggests that presage factors (student achievement goals and perceptions of the learning environment) directly
influence process factors (student approaches to learning) and the product factor (SDL readiness). It also suggests that process factors mediate between presage and product factors. The specific aims for this survey were therefore to:

1. test how student achievement goals and perceptions of the learning environment influence their SDL readiness;
2. investigate how student achievement goals and perceptions of the learning environment influence their approaches to learning;
3. examine the effect of student approaches to learning in mediating the relationship between their achievement goals and SDL readiness; and
4. examine the effect of student approaches to learning in mediating the relationship between their perceptions of the learning environment and SDL readiness.

4.4.2.2 Research questions

To achieve the research aims, four research questions and respective sub-questions were proposed for this study.

**Research question 1**

Do student achievement goals and perceptions of the learning environment influence to their SDL readiness?

*Sub-question 1.1: How much variance in the SDL readiness of Taiwanese nursing students can be accounted for by their achievement goals and perceptions of the learning environment?*

*Sub-question 1.2: Amongst the achievement goals and*
perceptions of the learning environment, what are the significant factors influencing Taiwanese nursing students’ SDL readiness?

**Research question 2**

Do student achievement goals and perceptions of the learning environment influence to their approaches to learning?

*Sub-question 2.1: How much variance in students’ adoption of deep approaches to learning can be accounted for by their achievement goals and perceptions of the learning environment?*

*Sub-question 2.2: Amongst the achievement goals and perceptions of the learning environment, what are the significant factors influencing Taiwanese nursing students’ adoption of deep approaches to learning?*

*Sub-question 2.3: How much variance in students’ adoption of surface approaches to learning can be accounted for by their achievement goals and perceptions of the learning environment?*

*Sub-question 2.4: Amongst the achievement goals and perceptions of the learning environment, what are the significant factors influencing Taiwanese nursing students’ adoption of surface approaches to learning?*

**Research question 3**

Do student approaches to learning (deep or surface) mediate the relationship
between students’ achievement goals and their SDL readiness?

**Research question 4**

Do student approaches to learning (deep or surface) mediate the relationship between students’ perceptions of the learning environment and their SDL readiness?

### 4.4.2.3 Sample for the survey

The sample for the survey consisted of students who were studying full-time in the final year of the 2-year and the 4-year programs of the three participating nursing departments. By the time this survey was conducted, participants from the stage one interview study had graduated from the university. Therefore, this sample was different from the sample who participated in the stage one interviews.

### 4.4.2.4 Data collection

When the questionnaires were ready for distribution, the researcher arranged with relevant faculty members an appropriate time to meet with students and undertake the survey. Survey procedures were similar to the procedures of pilot testing. Each student received a set of questionnaires with an information sheet (Appendix 4.6) and students were encouraged to seek clarification about the research. A total of 422 sets of questionnaires were given to students, of which 369 copies were returned (87% response rate).

### 4.4.2.5 Sample size calculation

Multiple regression analyses were used to answer the research questions. Sample size calculation for multiple regression techniques is a complicated
issue because the adequacy depends on the chosen Type I and II error rates, the number of independent variables, expected magnitude of relationships (effect size) and the reliability of measurement (Cohen, 2003; Hair et al., 2006; Spicer, 2005). Cohen (2003) suggested a sample size calculation formula that has taken most of these factors into consideration.

\[ L = f^2 (n-k-1) \quad [ f^2 = \frac{R^2}{1- R^2} ] \]

L = tabled value for desired \( \alpha \) and power (Cohen, 2003. p.651)

\( n \) = sample size

\( k \) = number of independent variables

\( R^2 \) = estimated effect size

To calculate the appropriate sample size for this study, conventional choice of 0.05 and 0.20 (power=80%) for Type I and II error rates and a medium effect size of 0.2 (Cohen, 2003) were made. The L value for 12 independent variables and 80% of power is 17.34.

\[ f^2 = \frac{0.2}{1-0.2} = 0.25. \]

\[ 17.34 = 0.25 (n-12-1) \]

\( n = 83 \)

The expected sample size needed is 83 participants. In this study, the sample of 369 participants is adequate for multiple regression analysis.

4.4.2.6 Survey data analysis

Data preparation

The data preparation procedures involved data entry and data cleaning. Participants’ responses on each questionnaire were entered into a SPSS data file. The accuracy of data entry was checked through a series of frequency
analyses. Moreover, 37 copies (10% of the total copies) were randomly selected to check correctness.

**Descriptive and bivariate analysis**

Initially, descriptive analysis was used to describe the characteristics of participants and to test assumptions for further analysis. Bivariate analyses, such as independent t-test and correlation tests, were used to determine whether there were relationships between the proposed independent variables (achievement goals and perceptions of the learning environment) and dependent variables (learning approaches and SDL readiness).

**Hierarchical multiple regression**

A hierarchical multiple regression approach was used to estimate how a set of variables explained the proportion of the variance in the dependent variables, as well as to examine the relative predictive importance of each independent variable (Hair et al., 2006; Polit & Beck, 2006; Spicer, 2005). The results of the present survey were reported through the following regression statistics: $R^2$ and adjusted $R^2$; regression coefficient ($B$); and standardised beta coefficient ($\beta$).

$R^2$ is used to explain the extent to which independent variable(s) uniquely or jointly explain the variation in a dependent variable. By assessing the changes of $R^2$ when adding a new (group of) independent variable(s) to a regression equation, the $R^2$ change represents the extent to which the new (group of) independent variable(s) increases the power of prediction. $R^2$ is often affected by the number of independent variables and sample size, accordingly, adjusted $R^2$ is used to provide a better estimation of overall prediction. The statistical significance of $R^2$ increment and adjusted $R^2$ are
assessed by the $F$ statistics. The regression coefficient ($B$) indicates the average amount the dependent variable increases when the independent variable increases one unit. The standardised beta ($\beta$) coefficient is the $B$ coefficient for standardised data which helps assess the relative importance of the independent variables using different measuring units.

The hierarchical multiple regressions can also be used to analyse the mediating effects where the relationship between independent and dependent variables is mediated through a second independent variable (Baron & Kenny, 1986; Holmbeck, 1997; Murrell, Salsman, & Meeks, 2004; Spicer, 2005). Baron and Kenny (1986) explained that “the mediator function of a third variable ... represents the generative mechanism through which the focal independent variable is able to influence the dependent variable of interest” (p.1173). If a mediating effect exists, it is considered that an independent variable has an indirect effect on the dependent variable through the mediating variable (Spicer, 2005).

Baron and Kenny (1986) pointed out that the following conditions as being necessary to demonstrate a variable serves as a mediator (see paths in Figure 4.8): (1) the independent variable(s) must have a significant relationship with the mediator(s) (Path 1); (2) the mediator(s) must have a significant relationship with the dependent variable (Path 2); and (3) the independent variable(s) must have a significant relationship with the dependent variable (Path 3). Finally, to test for a mediating effect, the dependent variable is to regress on both the independent and the mediator. The new coefficient for the independent variable on the dependent variable (Path 3’) is expected to reduce.
Figure 4.8: Paths of mediating effect

The reduction of beta coefficient from Path 3 to Path 3’ is the indicator of mediating effect. Baron and Kenny (1986) suggested that, for a ‘full mediation’ effect, the Path 3’ coefficient becomes zero; for ‘partial mediation’, the Path 3’ coefficient becomes non-significant. Holmbeck (1997) proposed a less conservative criterion for a mediating effect. He suggested that any reduction of the beta coefficient from Path 3 to Path 3’ indicated a potent mediating effect, the greater the reduction in coefficient, the stronger the mediating contribution.

In this study, students’ approaches to learning are the proposed mediators between student achievement goals, perceptions of the learning environment and SDL readiness (as proposed in research questions 3 and 4). These hierarchical multiple regression procedures suggested by Baron and Kenny (1986) were used to test the mediating effects of learning approaches.

4.5 Ethical Considerations

Ethics approvals for this research were obtained from the Ethics Committee
of the Queensland University of Technology, as well as from the participating nursing schools (Appendix 4.1). In addition, the following issues were carefully considered by the researcher at all times and were explained to the participants:

1. The purpose of this research is to improve the quality of teaching and learning in undergraduate nursing programs.

2. At the time of this study, the researcher was not involved in teaching the students in any of the participating nursing schools; this helped to minimise students feeling that their participation in the research project was in any way coerced.

3. Students’ participation was entirely voluntary. The decisions students made about participation or withdrawal would not affect their academic outcomes.

4. Students were provided with detailed information about the purpose of the research, their rights as participants and the researcher’s contact details.

5. Students’ privacy and anonymity were assured. When quoting from an interview, the researcher disguised the personal identity of the interviewee by using a code. Data collected from the questionnaire survey were expressed as group information. No participant’s personal information will be identified in any publications related to this study.

6. Collected data including interview audiotapes and transcriptions are being stored safely and can be accessed only by the researcher. Staff from participating schools will not be provided with access to any information about individual student.
4.6 Summary

This chapter introduced the research methodology and methods for this study. A mixed-method design, involving qualitative and quantitative approaches, was adopted to investigate the key issues in relation to this investigation. Following the discussion of methodological foundations, a detailed description of the implementation of research methods was set out. This description included information about aims of study, participant selection, data collection and data analysis procedures, for the stage one and stage two studies. The ethical considerations for this study have also been outlined in this chapter.

The primary focus of this chapter has been to provide descriptions for the research process and its applicability to the research questions at hand. The following chapter describes in detail the results of the stage one study. The themes and categories that emerged from the interviews are revealed.
Chapter 5: Stage One Study Results

5.1 Introduction

This chapter presents findings from the interviews conducted with eight students. Three main concepts — experiences of studying nursing programs; factors influencing the outcome of learning activities encouraging student self-direction; and perceived learning outcomes after undertaking these learning activities — are used to structure the presentation of results. The first section (Section 5.2) describes participants’ learning experiences in their past and present nursing programs, particularly, their experience with learning activities which they perceived to be self-directed. The second section (Section 5.3) focuses on students’ perceptions of factors which enhance or hinder the progress and outcome of these perceived self-directed learning activities. The third section (Section 5.4) reports on students’ perceptions of the learning outcomes from engaging in these learning activities. For each concept, recurring themes presented in the data are listed. Each theme comprised various categories of data. In this chapter, each theme and category is explained and supported by selected extracts from the interview data in order to capture the essence of participants’ responses. The final section of this chapter (Section 5.5) presents a summary of this stage one study.

5.2 Experiences of Studying Nursing Programs

Participants in the stage one study were studying the final year of a 2- or 4-year undergraduate nursing program. Five participants were studying in the 2-year program. Among them, student A and F graduated from a 5-year junior college, while student C, G and H completed a 3-year vocational high
school study, then a 2-year junior college program. The other three were in the 4-year program. They had entered the current program after completing 3 years of vocational high school study.

When asked about their experiences of studying nursing, most participants revealed impressions of significant differences in teaching and learning styles between their past school-based education and current undergraduate programs. For many, university teaching styles presented a number of challenges which students perceived to be significant to their learning experiences. One theme and three categories were generated from the interview data in relation to participants’ experiences with previous and current education environments (Table 5.7).

Table 5.7: Theme and categories of students’ experiences of studying nursing programs

<table>
<thead>
<tr>
<th>Theme</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>A shift in teaching and learning styles</td>
<td>♦ From ‘duck-feeding’ to interactive teaching</td>
</tr>
<tr>
<td></td>
<td>♦ From passive to active learning</td>
</tr>
<tr>
<td></td>
<td>♦ Having varied experiences of self-directed learning</td>
</tr>
</tbody>
</table>

5.2.1 A shift in teaching and learning styles

Many participants described their previous learning experiences in vocational high schools or colleges as being ‘duck-feeding’ (spoon-feeding). Students perceived that this teaching style was largely focused on nursing related knowledge and facts from textbooks, and that teachers seemed to be trying to deliver as much knowledge as possible. Some students therefore reported feeling the need to memorise the examinable content of every subject. For example, many participants described they were often busy
learning, but somehow felt a lack of comprehensive understanding of the learning content. As student D described:

*I feel that we only studied the content of textbooks in vocational high school, and I feel we studied only for exams... We did learn something but I didn't feel very strongly (about having learnt something). When I started the nursing course, I expected that nursing would be... like (we can) dissect something... very fresh (new). But we only studied the textbooks, kind of a 'duck-feeding' style of teaching. It's like I only had to study what the teachers had taught in order to achieve an 'all pass' (passes in all subjects).*

Such exam-oriented teaching may have encouraged a surface learning approach, where student learning is concentrated on memorising facts and exam preparation. For example, Student G pointed out:

*Teachers in my nursing college and vocational high school used a 'duck-feeding' teaching style. They highlighted exam questions and answers before the exams, all we had to do was to memorise them. Usually we didn't do any study until teachers finished highlighting exam questions... We soon forgot about it (the memorised content) after the exams were over.*

When participants entered undergraduate programs, many reported experiencing a shift from 'duck-feeding’ to a more interactive style of teaching. Although the majority of teaching activities were still lecture-based, participants described how some teachers also tried to
encourage them to be active in learning. These students reported that strategies of problem solving, concept mapping and critical thinking were often emphasised by teachers and applied in teaching activities. In these activities, students described how they were encouraged to elaborate or explore ideas based on knowledge and facts obtained from previous education and experiences. Some students further described that this shift in teaching approach had encouraged them to become more deeply involved in learning nursing. For example, Student H stated that undergraduate study made her feel fulfilled in learning:

In vocational high school, we were taught basic things (knowledge) because we knew nothing (about nursing) in the beginning. So the teachers gave us basic things (knowledge). Mostly it was rote learning stuff, something dead (dead knowledge). In university, the teacher in each subject taught us how to do a report using critical thinking strategies. I felt more fulfilled after studying the undergraduate program because I found nursing can be quite interesting. Teachers at university taught us how to view an (health) incident from different aspects, which encouraged us to think more and to think deeper.

When participants were asked about their experience of “learning activities which were directed by yourself or your group” (interview question 4), a number of learning activities that participants perceived to be self-directed were introduced during their undergraduate study. The extent to which these learning activities were directed by students varied. For example, some participants recalled that these learning activities involved simple report
writing in which the research topics and scope were often limited, such as a report regarding nursing diagnosis of patients with a certain disease. Other activities, such as independent project work, were described by students as allowing students to exercise more self-direction in their tasks.

A key feature of these learning activities described by participants was an emphasis on students’ initiative, active involvement and independence in the learning process. More specifically, participants described that these activities required students to decide their own topics, gather information and complete the task with limited direct input from the teacher. Sometimes, they also participated in the evaluation process. An example described by Student C illustrates these activities:

*Last semester, we took a subject called ‘Project Writing’ which is basically choosing a topic and write a small research project. We only had one lecture for this subject in the beginning of the semester when the lecturer in charge (of this subject) introduced herself and the tasks we have to complete. After that, we met her by appointment. My group decided to investigate alternative therapy, so we planned our own progress, did literature review, and had regular team meeting and discussion with the lecturer… Yes, we did all the work, really.*

In summary, students’ descriptions of their experiences with self-directed learning did vary considerably. That is, participants’ accounts suggest they were exposed to a range of learning activities which they perceived to be self-directed during their undergraduate study. The extent to which these
activities were self-directed did, however, vary. For example, in some activities, students were required to write simple reports of specific topics, while others required students to complete a project with limited direct instruction from the teaching staff.

Moreover, many participants described that the scope of the activities perceived as being self-directed was often constrained by academic requirements, such as the choice of study topics or time limits. Such findings are consistent with some SDL writers’ assertions that pursuing self-directed in learning to its extreme is not possible, especially with the constraints of professional education (Brookfield, 1986; Nolan & Nolan, 1997a). Recently, higher education researchers have acknowledged that student self-directed or self-managed work in the university is often semi-autonomous in nature (Lizzio & Wilson, 2005). Students may be responsible for managing learning tasks, however, the processes and outcomes are often influenced by the teaching staff (Lizzio & Wilson, 2005; Orsmond, Merry, & Reiling, 2004) or constrained by the availability of resources and curriculum content (Hewitt-Taylor, 2001, 2002; Lea, Stephenson, & Troy, 2003; Lunyk-Child et al., 2001). Nevertheless, a key finding in this study is that students perceived a clear shift in teaching styles compared to their previous experiences, whereby their active involvement in the learning process was now seen as integral to their learning experience.

5.3 Factors Influencing the Outcome of Student Perceived SDL Activities

A primary aim of the present study is to identify factors which influence self-directed learning. As such, in the interviews, participants were
Chapter 5

encouraged to share their positive and negative experiences with undertaking learning activities which they perceived to be self-directed, and to describe factors which influenced these experiences. Questions such as “what encourages (or discourages) you to manage the learning process?” and “what encourages you to want to do well in these activities?” were used to identify the factors supporting or preventing students from exercising self-direction in learning. When data were analysed, two distinct groups of influencing factors, environmental and motivational, were uncovered. The various themes and categories relating to these factors are presented in Table 5.8 and described in the following section.

Table 5.8: Themes and categories relating to students’ perceptions of factors influencing the process and outcome of SDL activities

<table>
<thead>
<tr>
<th>Themes</th>
<th>Categories</th>
<th>Subcategories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning environment factors</td>
<td>Teacher-student interaction</td>
<td>Teacher approachability and support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Teacher accessibility and availability</td>
</tr>
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<td></td>
<td></td>
<td>Teacher responsibility</td>
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<td></td>
<td>Facilitation process</td>
<td>Clear directions</td>
</tr>
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<td></td>
<td></td>
<td>Timely and constructive feedback</td>
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<td></td>
<td></td>
<td>Independent choices</td>
</tr>
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<td></td>
<td>Learning resources</td>
<td>Accessible workload</td>
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<td></td>
<td></td>
<td>Help with English publications</td>
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<tr>
<td>Motivation factors</td>
<td>Extrinsic motives</td>
<td>Marks (academic results)</td>
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<td></td>
<td></td>
<td>Avoiding ‘loss of face’</td>
</tr>
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<td></td>
<td>Intrinsic motives</td>
<td>Interest in the learning topics</td>
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<td></td>
<td></td>
<td>Fulfilling self-expectations</td>
</tr>
</tbody>
</table>

5.3.1 Learning environment factors

Implementing learning activities to encourage student self-direction in the
university environment has been associated with certain levels of anxiety for both teachers and students during the teaching and learning process (Hewitt-Taylor, 2001, 2002; Lunyk-Child, 2001). During the process of these activities, teachers may try to avoid directing students’ decisions, while at the same time, students may be anxious about whether they are “heading in the right direction” (Student B) without teachers directing each aspect of the learning activities. In the interviews, participants described aspects of the learning environment during the process of their perceived SDL activities that were influential to how they experienced these activities. Three main issues related to the learning environment were described by students: teacher-student interaction, facilitation process, and learning resources.

5.3.1.1 Teacher-student interaction

Teachers are important in constructing a learning environment because of their role in organising learning content and their direct contact with students (Prosser & Trigwell, 1999; Ramsden, 2003). In the process of learning activities encouraging student self-direction, opportunities for interaction between teachers and students may be different to those provided in a lecture-based teaching environment. Some participants described these interactions as often being closer, where students and teachers engage in deep level discussions about teaching-learning process and goals. Student D described:

*When teachers and students are having discussions, teachers can see if we are attentive to our work; and we can see if they are attentive to teaching too.*
Many participants described how their perceptions of teacher-student interaction influenced their responses and further enhanced or hindered their learning. In particular, three main characteristics of positive teacher-student interaction were identified in students’ accounts: teachers were approachable, accessible and available, and responsible.

**Teacher approachability and support**

Student self-direction requires students to develop skills in communication, problem solving, and social interaction (Knowles, 1980) as well as the ability to monitor the quality of their learning (Grow, 1991; Nolan & Nolan, 1997a). Teachers therefore need to provide an environment that facilitates development of these skills and enables discussions about learning progress (Garrison, 1997; Grow, 1991). Many participants described that approachable teachers often provided a positive teaching-learning interaction to enable them to develop confidence and skills in self-direction, as students were encouraged to ask questions, to discuss issues, and to gain support.

Some participants acknowledged teachers’ patience in listening to their questions, and providing reassurance through statements such as “it will be alright” or “just do your best”, were helpful in alleviating their anxiety. Student A recalled when she and her team did a report of a review of research articles, the lecturer had in-depth discussions with them and reassured them that they would be fine as long as they tried their best:

*I was very panicky at that time because we only had a little*
understanding about (nursing) research. I listed all my questions to which I couldn’t find the answers from the textbooks, and then asked the teacher. We talked for a long time. She seemed to sense my anxiety and told me not to worry. We only had to criticise these articles based on our understanding; to just try our best because it was our first time (to do such an exercise). I felt a little better and less anxious after that.

Student C mentioned a similar experience with a lecturer being very supportive when her team did a presentation about falls prevention to a group of elderly people. She appreciated the lecturer’s help was important not only in providing professional suggestions, but with providing emotional support as well:

There was not much information about falls prevention for the elderly, especially in the area of ‘knowledge of falls prevention for the elderly’. Our teacher told us that we could look at some English articles. She even offered to look for some articles for us if we really had difficulties... The teacher encouraged us a lot. She assured us that we would be all right, and I should have confidence in myself. She interacted positively with us. We had a successful presentation, and I had a great sense of achievement after that activity.

In contrast, some participants felt unable to approach some teachers, resulting in negative experiences with self-directed learning activities. Most participants said their reluctance to approach some teachers was due to
teachers showing little respect for or not caring about students. For example, Student D found some teachers’ careless criticism towards their work was destructive:

When we were doing these reports... I found some teachers were really disrespectful of students. For example, they criticised our work without any consideration, like “What are these references?! Do the literature searching again!” This made us really upset!

Student G similarly perceived some teachers showed little respect for students, as they would often keep students waiting for meetings without apology:

She (the teacher) never kept the schedule even when we made appointments well in advance. She just let students wait outside her office, sometimes we waited over half an hour, until she was available and then called us in for the meeting. She never apologised for the delays. It is quite disrespectful.

Student E also felt uncomfortable about the careless attitude of university teaching staff:

University teachers are less caring about students’ learning. They neither read our reports carefully nor listen to our problems.
These examples illustrate that the approachability and support provided by teachers may be important for creating a positive teaching-learning environment in which students feel able to develop skills required to be confident with self-directed learning. This finding is similar to Nolan and Nolan’s (1997a) study suggesting that students perceived an open climate of learning, in which the student’s welfare matters and teachers treat students on an equal basis, as important to their self-direction in learning. Regan (2003) also stressed that a supportive teacher-student interaction may help students to develop self-management skills, confidence and motivation to achieve better performance, and thereby, promote a satisfactory learning process and improved outcomes.

**Teacher accessibility and availability**

Many participants suggested that it was hard to contact some teachers or make an appointment with them. They believed that the current busy environment in the universities has impeded them from being able to have sufficient contact with teachers to enable them to participate actively in SDL activities. Student A summarised her observation of the busy and fast-paced teaching environment:

> It is very hard to access the teachers, they are very busy. Some of them are studying their PhDs and others have to cover administration work. There are also some teachers working part-time at school; we can hardly see them outside of lecture hours. We don’t know how to contact them when we have questions. Sending emails seemed to be inefficient; we had limited replies to emails from the teachers.
Student D pointed out that the lack of access to teachers had delayed her progress, and the time available for discussions with teachers were not sufficient:

*I hope we can access the teachers as soon as we have problems.*

*We like to make appointments with the teachers, but they are very busy. For example, if we were ready to discuss (the report) this week but we could not have a meeting until next week, our progress would be delayed. And the meeting time was usually not long enough. Sometimes in the middle of the discussion, the teacher hassled us and said “hurry up, there is another group waiting outside”.*

When teachers were not available, participants described that they may try to solve problems by themselves or by asking fellow students. On the one hand, this may represent students’ attempts to be self-directed in their learning. However, in most cases, students described the limited contact with teachers as preventing them from developing a deeper understanding of the self-directed learning tasks. Students also described that this resulted in increased anxiety levels, resulting in them feeling less confident in their work (Lea et al., 2003). Their motivation to achieve better performance and be confident in being self-directed was also reduced. These findings are consistent with the literature which suggests that lack of access to appropriate facilitation can result in students’ reluctance to exercise SDL skills in their future learning tasks (Lea et al., 2003).
Some participants suggested that a pre-arranged meeting schedule with teachers may provide a solution, as they believed this would assist students to be proactive in the learning process. Student C suggested:

_Some teachers require us to have about three meetings with them before submission and presentation of the report. We have to book ourselves in the teacher’s schedule. If we don’t meet this criterion, we receive lower marks (for our report). It somehow encourages us to have active and organised discussions with the teachers. They tell us what needs to be added or reinforced in our report at each meeting, and we show them the changes at the next. I feel comfortable about such process because I know the report has met teachers’ expectation._

These findings are consistent with Lizzio and Wilson’s (2005) study which suggested that staff availability is one of the factors that students perceived to be important to their satisfaction and productivity with self-managed work.

**Teacher responsibility**

A further commonly recurring theme in the interviews was students’ belief that self-direction did not mean that teachers handed complete responsibility to students. Rather, many students expressed the strong view that teachers had significant responsibilities in the SDL process. For example, participants revealed that they often felt these learning activities were ‘dumped’ on them at the beginning of a semester, with the teachers’ role only being to evaluate the outcomes. Student B said:
I think some teachers asked us to do these activities so that they can do less teaching. They didn’t want to help us at all. We had one lecturer, when we asked her to read our drafts, she said “well, I will read your report when you submit it”; when we asked her questions; she said “you are old enough to work them out yourselves.” When we finally did presentations, she just sat there and criticised our work badly... we were all very angry. I think that is very irresponsible.

This finding is similar to previous research findings that students sometimes felt they are left alone in the process of learning activities requiring student self-direction (Hewitt-Taylor, 2001, 2002; Lea et al., 2003), and that students may perceive these activities as being an easy teaching option for teachers (Hewitt-Taylor, 2001, 2002). Student A offered a clear statement of students’ needs for appropriate guidance during the process of these learning activities. She referred to teachers’ involvement in students’ learning activities as ‘being responsible’.

I don’t mind doing these reports but we need appropriate assistance from the teachers through regular meetings and discussions... I think if teachers ask us to do these reports, they should be responsible for us too. That is, if students have decided on their topics, teachers can briefly point out the directions of the report, or the main concepts, to help students capture their directions. When students have discussions with teachers, they should provide some suggestions.
Such comments, which might be considered to reflect a lack of autonomy on the part of students, may suggest that students may not be adequately prepared or effectively engaged in SDL activities. Alternatively, the comments may also suggest that certain facilitation strategies are important teaching behaviours in SDL. For example, in the context of SDL, teachers are often required to become facilitators who are working with students and transferring authority and responsibility of self-direction to students themselves (Brockett & Hiemstra, 1991; Brookfield, 1986). Indeed, recent authors suggest that the idea that students should be responsible for and autonomous in learning does not mean that they should be left to their naïve capabilities to manage learning tasks themselves (Lizzio & Wilson, 2005). The challenge for teachers is to structure facilitating strategies to support students, but not prevent them from achieving higher SDL abilities.

5.3.1.2 Facilitation process

The above descriptions highlight that students perceived teachers’ responsibility in the context of their perceived SDL activities is not simply transmitting information. Indeed, the literature suggests teaching roles are more about examining the learning outcomes that teachers anticipate and making these explicit to their students (Livingstone & Lynch, 2000; Regan, 2003; Wilcox, 1996). Once the expected learning outcomes (one of which may be improving students’ self-direction in learning) have been identified, it has been suggested that an organised set of facilitation strategies should be integrated into the teaching plan (Livingstone & Lynch, 2000; Wilcox, 1996). The literature suggests the nature of these strategies should be encouraging students to move from a dependent teacher-directed learning
approach towards a supported SDL approach (Pilling-Cormick, 1997; Stubblefield, 1981).

Most participants in this study emphasised the need for a structured facilitation process throughout the learning process. Four specific themes emerged which reflected the facilitation strategies participants saw as being important to SDL, namely, clear directions, timely and constructive suggestions, independent choices, and appropriate workload.

**Clear directions**

Student B described her negative impression about some teachers suggesting ‘university student level’ as being the learning goal. This student described her frustrations and disappointment at being unable to achieve expected outcomes because this learning goal was not clearly described.

*Teachers mentioned a lot about ‘university student level’... I just don’t know what they mean by ‘university student level’. They neither told us what we are expected to do, nor showed us examples of ‘university student level’ work. So I think, from their point of view, we probably never achieved that level.*

Lack of clear goals and direction may lead students to focus on what teachers want and on what “*suits teachers’ taste*” (Student F) instead of setting their own learning goals. Students also described how this caused them anxiety and uncertainty. Student F’s statement addressed such issues:

*We faced the same problems every time we did our reports, that*
is, we are not sure if the product (report) has suited teachers’ ‘taste’ or not. I felt that we need answers from the teacher all the time. So I really hope teachers can clearly inform us about the standards in the beginning. It is important to set certain boundaries and goals that we can follow.

Student F further suggested that students’ understanding of the learning goal is also important. She recalled a situation where she was not provided with a clear guideline and that this reduced her motivation to achieve:

*The teacher gave us a framework of ‘organisation structure’.*

*The learning activity was to investigate a nursing organisation and to describe the management system based on this ‘structure’. It was very complicated to us, and the teacher did not explain it well... or maybe we couldn’t understand it... the teacher did not have time to meet with us. In the end, we just roughly finished the report and submitted it, and hoped we would get a pass.*

On the other hand, some participants shared their positive experiences of undertaking learning activities with a clear learning guide. They described that a clear learning guide often included two components: a list of descriptions addressing the quality of professional and personal abilities expected to be achieved from undertaking the learning activity; and a list of marking criteria detailing how these abilities would be evaluated. Such lists were seen to provide a guideline to assist students in goal setting, prioritising tasks, time management and self-evaluation. Student H said:
Chapter 5

The objectives and marking criteria (of the learning activity) provide a clear guide for us. Usually the teachers explain a bit more (about the objectives and marking criteria) in class and we can ask questions. We often start our group discussions and set timeline based on the list. It is quite helpful.

Student G also believed the provision of marking criteria helped her future success:

Some teachers gave us assignment results on the marking criteria. For example, if 20% (of the total marks was loaded) on the literature review session, and I only got 16%, I would realise that my literature review was not thorough enough or there were other problems in relation to this session. I think it is a really good idea (to have a clear marking list) but only a few teachers did this.

In addition, Student B suggested that the marking criteria allowed “teachers and students to work together on the marking process”. Usually, the results of these learning activities were evaluated by the teacher. At times, students commented that they experienced subjective and biased marks. Participants who made these comments often suggested that strategies were needed to enhance the fairness of academic results. For example, Student H believed that the inter-group evaluation provided an opportunity to enhance the fairness and to learn from their peers:

We had to pay a closer attention to other groups’ presentations
to give them marks. At the same time, we observed their merits and/or faults, and we learn from them.

Student B also suggested:

We gave marks to other groups’ presentations. The marks are given according to the marking criteria. We often have ten minutes discussion after each presentation talking about the overall performance of each group. I learned to evaluate my classmates’ performances. It helps me evaluate my own performance too!

These extracts suggest that evaluation of student learning outcomes from SDL was important to students. These latter examples also suggest that certain evaluation strategies may provide students with greater opportunities to reflect on their own performance and further improve their skills of self-evaluation.

**Timely and constructive suggestions**

Almost every participant emphasised the need for appropriate suggestions from the teacher during the process of engaging in SDL activities. They believed that timely and constructive suggestions during the learning process provided them with opportunities to reflect on their progress and to make further improvements. For example, Student F said:

Teachers’ suggestions can remind us to reflect on our direction of thinking, because we are students and we don’t have a lot of
experience in working on reports. We tend to simplify the whole theory and miss out some important concepts. So I think teachers can help redirect our thinking in a timely way.

While such ongoing feedback was reported to be of great benefit to the learners, Student F’s comment, that “teachers can redirect our thinking”, may suggest a precaution should be taken when giving students feedback. As teachers are often seen as the authority in Taiwan’s teaching and learning environment, inappropriate suggestions from the teacher may cause confusion and uncertainty to students, and consequently impede students from making independent judgments. Student A described that, on some occasions, the progress of their work was dependent on teachers’ feedback on a step-by-step basis:

*We always sought the teacher’s opinions when we completed one section of the report. We didn’t dare to leave it until we completed the whole lot, because we may have headed in the wrong direction.*

Some participants mentioned that they were prepared to accept positive and negative comments about their work. Positive comments appeared to be rewarding to students. Student A took her presentation of ‘nursing research review’ as an example:

*The teacher complimented us for the detailed nature of our analysis. I felt very happy at that moment. It had been a very difficult process working on this report. But I felt very rewarded*
On the other hand, some participants stressed that they learned more from the constructive criticisms they received. They believed such constructive feedback has helped them recognise their strengths and weaknesses and provided them with suggestions for further improvement. Student F suggested:

*I hope the teachers can spend a bit more time analysing the good and bad aspects of our reports. Take a presentation for example: the teacher can tell us the good aspects in our PowerPoint slides and the content, and what can be improved in the future presentations. Concrete and constructive suggestions are what we need, not just general comments such as “this is not good enough”. We can never figure out what needs to be done to make it better!*

Similar issues were addressed regarding feedback on written reports. Participants expected teachers to write more comments on the reports, but they often received feedback of “no comments, marks only” (Student G). It was also appreciated when teachers provided students with some examples from senior or fellow students. Student B recalled a clinical instructor who adopted such a strategy:

*The teacher summarised the weaknesses of our reports and how to improve them. She also showed us some good examples of other classmates and pointed out why they were good reports.*
That helped me realise that it is possible to do a good report and how to do it.

It is evident that participants generally valued suggestions from their teachers. They suggested that timely and constructive suggestions helped maintain the momentum of directing their own learning tasks, stimulate their thinking and motivate them to achieve better learning outcomes.

**Independent choices**

On one hand, participants in this study commonly expected to be given clear directions and constructive feedback during the process of these perceived SDL activities. On the other, when they understood the learning goals and felt confident about it, many looked forward to having independent choices in determining how the work could be executed and elaborated. Some participants spoke about the benefits they derived from having a degree of freedom in their learning tasks. They pointed out that being able to choose a topic of interest and creating their own way to elaborate and present the selected topic had encouraged them to become more involved in the task. As Student D described:

*Teachers in university completely let go of the control of our work and rarely interfere by giving too many of their opinions. So we could make the report in our own way which helped us learn quicker.*

Student B suggested:
If I choose my own topic, I will be interested in reading relevant information. When the teacher assigned me a topic that does not interest me, I found it was hard to get involved in the readings. So I hope teachers can try to understand what I want to know rather than what they want me to know.

The freedom of choice appeared to enhance some students’ ability and interest in directing their own learning. Lack of freedom, on the other hand, may hinder some students’ involvement and motivation in learning. Student C described her frustrating experience of an interview report in which students perceived the teacher limited the choice of interviewees and criticised the group’s results in a subjective manner:

The teacher gave us a list of interviewees to choose from. She made students interview these same persons year after year, so she knows the interviewees better than we do. When we presented our results, she said we had missed out some important information about our interviewee. She was expecting some information she knows but we don’t. It is so frustrating! I felt I did an awful job in this report and I completely lost interest in this subject after that.

At times, making such independent choices was a difficult process for students. Some participants described that when the direction of an activity was not clearly defined, they often felt frustrated during the decision-making process. For example, Student B said:
I was quite interested in this subject (community nursing) because I thought we were allowed to choose our favoured topics. But when we did make decisions, the teacher always seemed to hold different opinions. We ended up asking the teacher to assign us a topic. It saved us some time wandering around like headless flies.

Other participants described occasions when they were not confident about making independent choices due to insufficient knowledge and experience. They appreciated teachers giving constructive suggestions in assisting their decision making. As Student H described:

_We didn’t know where to start, so we had to discuss the topics with our teacher. She helped us organise a list of relevant topics and we did brief research of these topics. Then we made decisions according to the results of our research._

Student C also described how a lecturer had given them constructive suggestions by asking open questions and encouraging independent choices:

_The teacher started her suggestions by asking open questions, and we were prompted to think about and discuss possible solutions to improve our report and presentation. If something seemed to be missing in our report, she simply asked us questions such as ‘Is there any other concepts that you can use to support your report?’ or ‘what other methods can be included in your presentation besides a role-play?’_
In summary, some participants have suggested that being able to make independent decisions for their learning tasks, such as choosing topics of their interest, did lead to a greater commitment to learning and often resulted in higher levels of motivation and more satisfactory learning processes. Lack of choices and clear direction, on the other hand, seemed to be perceived by some participants as discouraging to their self-direction in learning. These findings may suggest a link between clear direction, constructive suggestions and independent choices. That is, when the direction and goals of SDL activities are made clear at the commencement of each activity, student learning may be enhanced.

**Appropriate workload**

Participants described their study schedule as being very busy because class hours were often filled with lectures and clinical practice sessions. Students perceived SDL activities often required them to devote extra hours to review literature and participate in group meetings. Content overload was perceived by many participants as a factor inhibiting learning. Student G explained her experience of excess workload in some subjects she was undertaking which had caused her struggle to comprehend the content:

> Usually the content of the report is only a small part of the overall syllabus. When doing these reports, we have to research and review a great range of literature which means that I have to temporarily leave the rest of my studies aside. Soon after the reports are finalised, I have to pick up the examinable part of the syllabus and try to memorise it all. It is overwhelming... I just
Student F talked about feeling overwhelmed when reports and assignments were often due during the same period of time (usually in the last few weeks of a semester). She suggested that a negotiable schedule would be most appreciated:

*I hope teachers can discuss the timetables with us. This is because we have many subjects to study in a semester, and sometimes we have to do clinical practicum for several weeks during the semester. If many of our reports were due in the same weeks, it would become a huge workload for us.*

Many participants indicated that the content overload described above could be dealt with by skills of time management. Student H explained:

*Usually we do a pretty good job in planning, if we know all the tasks we have to do in the beginning of the semester. Especially we have done a lot of practice (in planning) in the past few years. Then we stick to our plans and complete the tasks, no problem. But you know, sometimes something happen can really ruin the whole plan, and that annoys me.*

Some participants, like student H, described unexpected circumstances that could disrupt their study plan and result in excessive workloads. Examples of such unexpected circumstances were when students were asked to substantially modify their reports at a time very close to deadline, or their
team members avoided responsibilities which left the rest of the team members with extra work. Student B described her experience when a substitute teacher took over a subject in the middle of a semester, and asked them to re-work their reports. The excess workload had diminished their willingness to exercise skills of self-direction:

_We almost finished the report. We had been working on the report for many weeks. It was like we had to do it all over again. I understood that what the teacher suggested was right, but we had taken a different direction (before she came along)… We had wasted so much effort and time. In the end, we all became very impatient in working on that report. So we just followed the teacher’s guideline carefully, copied information from articles and textbooks… We only wanted to finish it, couldn’t care about the quality at all._

In generally, when appropriate schedules were arranged, participants perceived themselves to be able to manage workload effectively. However, it was suggested by some participants that excess workload caused by unexpected circumstances may impede their ability to be self-directed in these learning activities.

5.3.1.3 Learning resources

Identifying human and material resources for learning is an important component of self-direction in learning (Knowles, 1975). University students are often encouraged to retrieve and read relevant information for their learning tasks. In the interviews, participants described their
difficulties in searching for and understanding literature relevant to their learning activities.

Firstly, some participants revealed the need to learn appropriate approaches for retrieving information. They stated that they had searched non-scholarly magazines, websites and books before they were taught to access academic resources. An introduction session to retrieving information from library catalogues and online databases in the beginning of the student’s first year was strongly suggested. For example, Student H said:

\[
\text{We had a two-hour library session when we started first year. The lecturer and a librarian show us around the library, especially the sections of nursing and medical books and journals. The introduction of how to search articles from the database was confusing at that time. But it turned out to be very handy when we need to do literature search, and our librarians are very helpful too.}
\]

However, some participants pointed out that the available resources in their school library in terms of books, journals and databases were “far from enough” (Student A). Student G’s experience in searching for some essential articles for her report portrayed an example of inadequate literature searching skills and the lack of accessible resources:

\[
\text{For students like us, information searching is really difficult. I can’t remember if I had been taught how to retrieve information from the internet. Some teachers might have mentioned online}
\]
databases, but we have to pay to access them. I remember once we needed an article which could not be printed out online. I asked a friend of mine (in Taipei) to go to the National Central Library to photocopy it and fax it to me... The available learning resources are even lesser in the hospitals where we did our clinical practicum. So I think literature searching is a big problem for students.

Difficulty in reading English was another significant issue raised by many participants. It is common that nursing students in Taiwan are required to include a certain number of English articles in their reports. Participants believed their English reading ability was very poor. Reading and understanding English articles had therefore become a time-consuming and frustrating process. They usually started the task by translating every word in the article. Student A described her struggles during the process:

_Usually we are required to include at least three English articles in our report. Reading English articles is very difficult for me. I always translate every word. I am afraid if I miss any word, I might misunderstand the real meanings of the article. Yet it is very frustrating because even when I translate every single word, I still can’t understand the meaning of a sentence!_

Student A therefore appreciated the times that university teachers assisted students in selecting suitable literature which may have prevented them from wasting time in translating irrelevant articles.
Some teachers have told us that we can select relevant articles by reading abstracts. To tell the truth, it is very difficult for us to understand the abstract. We often waste a lot of time translating irrelevant articles. So I hope teachers can help us select relevant articles before we start the translation procedure.

Student D believed that time spent on searching for or translating articles would be better spent on comprehending the information in the articles:

The quicker we gather enough literature, the more time we have to spend on reading and digesting the information. So we can properly inform our audience by giving an organised report and presentation, make them clearly understand our research topic. I believe it is better than wasting a lot of time searching and translating articles, with little time left to comprehend the knowledge. We could end up just copying information from the literature and reading out word by word from our report in the presentation.

This extract may reflect students’ need for sufficient time to understand and integrate the information. Students in this study felt that the time-consuming translation process had impeded them from understanding their learning topics. Some therefore suggested that university teachers may assist by prioritising their expected outcomes of student learning to encourage deep understanding and integration of the information, rather than focusing on the number of English articles included in the reference list.
5.3.2 Motivation factors

For many participants, gaining a Bachelor degree was the prime reason for the decision to pursue undergraduate study. They suggested that this qualification increased job and promotion opportunities. In addition to acknowledging these external motives, some participants talked about the necessity for learning, in terms of gaining more nursing knowledge and improving clinical competence, was also an important reason. As Student A summarised:

Some hospitals (in Taipei) only recruit nurses with a bachelor degree. I think I should improve my qualifications. Additionally, I feel I didn’t learn enough about nursing in junior college. I can’t join the workforce just like that. I will be in a state of panic. So I think I had better spend another two years (in the university) to improve myself.

When further asked about what motivated them to complete these perceived SDL activities, almost every participant’s initial response was ‘marks’. This response may simply reflect their motive of pursuing undergraduate study for the bachelor degree. However, many of them had further indicated that while the academic results may be the main reason driving them, there were other aspects of motivation stimulating them to achieve better performance and outcomes.

Student G believed that she was often motivated by academic results and a good performance in front of the teacher and peers:
I think we all work hard for marks because we want to complete the degree. Besides, we like to do well in our presentations, to show the teacher and classmates that we work hard... and to avoid ‘loss of face’, of course.

However, she further described that, on a few occasions, she was strongly motivated by her interest of the learning topic:

I remember I was strongly motivated when I was doing a report about ‘mother-child attachment relationship’. I was very interested in this topic. Maybe it is because I do not have a good relationship with my parents, and I wanted to know why. I visited quite a few libraries, read a lot, and learned a lot... I got a pretty good mark for this report, but I don’t really care (about the results).

Student B said that she was not very interested in nursing. Her general aim of study was to pass every subject. Nevertheless, she believed that she could become motivated if the learning topic interested her. For example, she recalled an impressive experience of taking care of a young woman who went through a procedure of medical abortion. This experience stimulated her interest in women’s responses to abortion and motivated her to produce a piece of work with which she was satisfied:

She (the young woman) was crying and screaming before the abortion procedure... I didn’t know what to do. My clinical instructor encouraged me to accompany her after she recovered...
from the anaesthesia, and talk to her if she wanted. But she became so calm... didn’t want to talk about it. She even made jokes. It seemed that it (the abortion) never happened! I was astonished by such extreme reactions. So my clinical instructor encouraged me to research ‘abortion’ and theories of ‘loss’. We had a lot of discussions and she helped me with some problems. Finally, I compiled results of my investigation into a case report, and I felt very satisfied with this learning process.

These extracts may suggest a link between intrinsic interest and students being active in learning. That is, for some students, their curiosity about the research topic seems to encourage them to direct their learning process. Satisfaction with the learning experience was considered more important than extrinsic rewards, such as academic results. However, participants were not always interested in their learning topics. For some participants, academic performance and sense of responsibility for personal achievement may be important factors influencing the process of SDL activities. As Student A described:

*I think my motivations (to complete these learning activities) come from... Firstly, I cherish my ‘face’. Bad academic performance is something I reckon to be ‘losing-face’. Secondly, I like to try my best to complete every task to see how much I can achieve. Thirdly, I feel I have to be responsible for myself. I have spent time on a task; I expected to get the best results in return for my effort.*
These data revealed a range of motives stimulating students towards the completion of SDL activities. Students worked on these activities in order to pass subject requirements; to achieve a better performance; to avoid ‘loss of face’ in front of their peers; to satisfy the curiosity or interest in certain topics; and to fulfil self-expectations. The first three motives might be seen as extrinsic motivations, in which students’ intentions for study are driven by rewards (academic achievement and praise) and to avoid possible embarrassment from failure or bad performance (Biggs and Moore, 1993; Ramsden, 2003). The fourth and fifth sub-categories represented students’ intrinsic desire to satisfy their curiosity and/or to achieve their personal learning goals (Biggs and Moore, 1993; Ramsden, 2003). These extrinsic and intrinsic factors seemed to influence the process and outcomes of perceived SDL activities.

This section has summarised participants’ experiences with learning activities which they perceived to be self-directed, in particular, aspects of the learning environment that were perceived as influencing these activities. The following conclusions may be drawn from students’ comments: (1) positive interactions with the teacher in terms of teachers being approachable and supportive enhanced students’ ability and confidence in managing their learning tasks; (2) teachers’ involvement in the learning tasks and use of appropriate facilitating strategies, such as providing students with clear directions and suggestions, allowing students to make independent choices when possible, helped improve students’ abilities in goal setting and self-evaluation; (3) lack of accessible and sufficient learning resources may limit students’ learning and cause them frustration.
Participants generally emphasised teachers’ personal and professional qualities, in terms of the teacher-student interaction and teachers’ facilitation strategies, as important to their learning experiences. This emphasis may result from the cultural and social tradition in Taiwan that teachers are often seen as an authority figure in education. As described in the previous section, participants’ learning experiences before undergraduate study were often recalled as being lecture-based and teacher-centred. Students may therefore find new challenges with participating in more independent learning approaches (Chan, 1999; Watkins & Biggs, 2001). In addition, it has been suggested that nurse educators in Taiwan may not have adequate training in education theories and strategies (Chung, 2004; Lu, 2004). Such inadequacy of training may limit nurse educators’ ability to use learner-centred teaching to encourage students towards being self-directed in learning. These limitations may contribute to students’ reliance on teacher reassurance and confirmation during the process of these perceived SDL activities.

Some participants further emphasised that they appreciated the opportunity of being able to make independent choices during the process of these learning activities. However, this emphasis might be seen to contradict issues raised by students in the theme ‘clear directions and constructive suggestions’ from the teachers. Participants firstly described the need for seeking teachers’ direction and suggestion, at the same time, they expected to be able to make independent decisions for their learning tasks. This finding reflects the semi-autonomous nature of student-directed learning activities in the university environment (where students are expected to manage their own learning tasks, however, the results are decided by the teaching staff) (Lizzio & Wilson, 2005).
Participants generally believed that their motivation is also important to stimulate them towards the completion of each learning activity. Some described how their personal intrinsic motivations (interest in nursing for its own sake and/or in particular learning tasks; fulfilment of self-expectations) and extrinsic motivations (marks and grades; avoidance of ‘losing face’) impacted on their engagement in learning activities. Some students also suggested that both of these motivations stimulate them towards better performance.

5.4 Perceived learning outcomes

When participants were asked “how do you feel about these learning activities” and “what have you learned from these activities” (interview question 8 and 9), several benefits of activities perceived as encouraging self-directed in learning were identified by students. Participants generally found that being involved in these activities and working collaboratively with other students and teachers had enriched their learning. They noted that the learning outcomes they had achieved included not only a deeper understanding of learning topics but also some essential skills that may contribute to success in their future careers. For example, Student H said:

\begin{quote}
It is a training process for us. The skills we learned such as information retrieving will come in handy in the future, because we will be asked to submit reports to get promotions, or we may choose to do postgraduate study, these skills will be very useful.
\end{quote}

In general, participants perceived that they had achieved several outcomes
in terms of some essential learning skills and positive learning attitudes. Their descriptions fell into two themes: improvement of generic skills and a change of learning attitude (Table 5.9).

**Table 5.9: Themes and categories of students’ perceived learning outcomes of SDL activities**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Categories</th>
<th>Sub-categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvement of generic skills</td>
<td>Self-management skills</td>
<td>♦ Work/Teamwork arrangement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>♦ Time management</td>
</tr>
<tr>
<td></td>
<td>Information management</td>
<td>♦ Information retrieving</td>
</tr>
<tr>
<td></td>
<td>Communication skills</td>
<td>♦ English reading ability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>♦ Integrating information</td>
</tr>
<tr>
<td></td>
<td></td>
<td>♦ Communication with peers and teachers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>♦ Report writing and presentation</td>
</tr>
<tr>
<td>A change of learning attitude</td>
<td>From passive to more proactive</td>
<td></td>
</tr>
</tbody>
</table>

### 5.4.1 Improvement of generic skills

Participants generally acknowledged that they had learned a range of generic skills as a result of participating in SDL activities. These skills were summarised into three categories: self-management skills, information management skills, and communication skills.

#### 5.4.1.1 Self-management skills

Student A, like some other participants, believed her planning and self-management skills for these learning activities have improved:

*I often start planning by looking at the task requirement and setting timeline. When I have a general idea about what are the*
key requirements in the task and how much time I have, I can plan my working stages, such as literature searching: one week; reading and writing draft: 3 weeks; asking teachers feedback: if possible; and so on. Doing reports used to be a difficult task for me because it is not as simple as taking exams: you either study hard to pass the exam or not. Now I quite like writing report because I can manage it well, and I can elaborate my own ideas in the writings.

These self-management skills were also applied to group work. Student F’s reflection on her improvement in planning and management skills outlined an idea that was shared by several other participants. From doing these activities, she has learned to divide work fairly among team members, arrange team meetings and discussions with teachers, as well as monitor the progress of learning tasks:

We have learned to carefully schedule our working and discussion timetables in the beginning of a semester. And we keep monitoring the progress of each stage. If one team member had troubles, we all joined together to finish that job. I prefer work at a steady pace because we can possibly miss out important concepts in a report if we do it hurriedly. Time management skills are very helpful in dealing with such team work and meeting the deadline, because we have lectures, clinical practicum and also have to finish these reports all in one semester.
Other participants described how they learned such skills from working with and observing others. For example, Student E said:

*I am not good at planning... I am happy just being a group member and do what I am told. Some of the group leaders are very good at managing team work and encouraging group discussion. I learned a lot from them, but I still don’t like to do this kind of learning activities. It’s a hard work doing all the planning and organising.*

### 5.4.1.2 Information management skills

Many students also described how SDL activities encouraged the development of information management skills including retrieving literature and processing the information in this literature. Firstly, many participants believed that they had accumulated sufficient experience to guide them in finding necessary resources and literature. For example, student C revealed:

*After these activities, we realised that the information in textbooks was not up-to-date. We need more recent information for our reports, so we learned where and how to retrieve these articles. My ability of information retrieving has improved greatly.*

There was also a general increase in confidence in reading English articles among the participants. Given that some participants still struggled in reading English, Student A’s statement may represent a positive attitude
towards this challenge:

Although it is still difficult for me to read the English literature, I am more confident to try it now. I am having a lot of training during these two years. The medical knowledge is evolving every day. The articles in English journals are sufficient and advanced compared to those in Taiwanese journals. When I work in clinical settings in the future, I will be able to find out new knowledge from the English journals.

Participants also acknowledged that their ability to integrate information had improved. Student B described her difficulties in organising information from literature and incorporating theory into practice when she starting her undergraduate study. She was often overwhelmed by the sheer amount of literature she needed to read and organise. Although still seen as her weakness, she has adopted some strategies to make this task more manageable. Student G gave an example of how she integrated information into a report:

I have learned how to integrate a large amount of information into a report after doing these activities. Firstly, we listed section headings according to the topic, for example, introduction, pathology, treatment, prognosis, etc. Secondly, we threw pieces of information into their respective sections. Then we read through and understood the essence of each section, and started writing up and made changes according to our team discussions.
5.4.1.3 Communication skills

Most participants agreed that their communication skills have improved by being involved in SDL activities, as they described that they had learned to listen to different opinions, to clarify arguments and to negotiate acceptable results, and mediate conflicts. Student F said:

*Interpersonal communication skill, it's what I learned more about (from doing these activities). You know, you have to discuss with a group of people, speak out your opinions; at the same time, you have to critically argue with your group members in a diplomatic way… it's not easy.*

The improvement of presentation skills, both oral and written, was also mentioned by many participants. Some participants appreciated that these learning activities provided opportunities for them to exercise onstage courage and practise eloquence. Student C was impressed by her improvement in her presentation skills:

*I used to be very quiet in the class; I was very scared of asking questions in class let alone making speeches. After all these practices, I am more confident in expressing my opinions in groups and having presentations in front of my class.*

Student E, on the other hand, was more aware of her improvement in written communication skills. She suggested:

*I still don’t like to make oral presentation unless I absolutely
have to. I think I have improved most in documentation skills, such as typing, computer skills (word processing) and report writing. I know how to make a document look good.

In summary, these skills that participants described as been improved may reflect some characteristics of self-directed learners. The literature suggests self-directed learners need to be able to manage their own learning in terms of specifying the learning needs, planning the learning process, managing both human and material learning resources, and evaluating learning outcomes (Areglado et al, 1996; Candy, 1991; Knowles, 1975). Students may have positive and negative experiences with these activities, however, the implementation of these activities for participants in this study seemed to contribute to improvement in skills that are important to one’s self-directed learning abilities.

5.4.2 A change of learning attitude

When summarising their overall perceptions of activities perceived to be self-directed in nature, most participants agreed that undertaking such activities had encouraged them to become more active in learning. However, some participants emphasised that the balance between teacher-directed lectures and SDL activities should be considered, as they perceived lectures introduced broad concepts with SDL activities providing the opportunity for in-depth research of these concepts. As student F suggested:

*The lectures highlight important issues of each subject; the activities provide opportunities to investigate a particular issue in depth. So I believe they are both important to our learning, and should be both used to enrich our learning.*
Through engaging in activities which encouraged self-direction, some participants perceived that they had gained a sense of control and confidence in what they want to learn and how to learn it. The study skills they obtained, in terms of the ability to retrieve and understand information, appeared to support them to be confident in directing learning tasks. For example, Student G recalled her learning attitude had changed during her undergraduate study:

*I have become more active in learning during the past two years. It is a subtle change and I don’t know when and how it happened. I just become more proactive. For example, now I like to do information searching for some issues, not because the teacher told me to do so, but because I am interested in these issues and I know how to get the information I want. Also, because all the writings I have done, now when I read articles, I tend to focus on the whole text and try to comprehend the meanings, rather than pick up pieces of facts from the text.*

She further commented on how these learning activities reinforced such changes:

*Teachers are training us to be critical, independent and autonomous in learning (through these activities). I think these activities have a positive influence on these attributes. We worked through these activities while teachers played a supporting role in such learning situations. I think that is why we*
have become more active in learning.

Some participants appeared to prefer SDL activities to teacher-directed lectures, for example, Student H said:

*I prefer doing these activities because I learn better and develop more skills in this context. I always feel bored sitting in the class and listening to the lecturer.*

Extracts from these participants suggest a change of attitudes to learning. Such positive attitudes towards learning reflect learner characteristics that are described in the literature as being important to self-directed learners, that is, being positive and open to learning opportunities and enjoying the learning experience (Fisher et al., 2001; Guglielmino, 1977; Knowles, 1975).

While most participants seemed to enjoy the skills and attitudes developed by engaging in perceived SDL activities, others continued to express a preference for a traditional sit-and-listen style of learning due to the difficulties associated with these learning activities. They expressed their reasons for disliking these activities, such as “these activities are time-consuming”, “I don’t really feel that I learn a lot from doing these activities” and “it is easier to just take exams than prepare presentations”. More investigation may be needed to understand the reasons for such perceptions and experiences.

Participants generally acknowledged that the practice of activities perceived
as being self-directed had helped them to improve some essential skills. These findings suggest that employing active learning strategies in undergraduate nursing program may help students to develop self-direction in learning. It should be also acknowledged that some students may continue to prefer more teacher-directed learning activities in some contexts, reflecting some SDL writers’ suggestion that not every student wants to be self-directed in learning in every situation (Brookfield, 1986; Darbyshire, 1993). For those students and in these situations, different teaching approaches may need to be explored to facilitate their learning.

5.5 Summary

The eight interviews provided data relating to students’ experiences of learning activities perceived by them to be self-directed. Firstly, participants perceived a shift in teaching and learning styles between the university and their previous nursing programs, acknowledging that teaching approaches in university often encouraged students to be more active in the learning process. Secondly, participants identified various learning activities in which they perceived their self-direction was encouraged.

Students further suggested factors which they perceived to enhance or hinder the development of SDL abilities. These factors included environmental and motivational factors. Teacher-student interaction, teachers’ facilitation process and the adequacy of learning resources played major roles in achieving satisfactory outcomes from perceived SDL activities. It was also evident that students’ motivation influenced their willingness to direct their own learning and the way they approached a learning task.
It has been suggested that teaching approaches which provide freedom of choice and involve students in accepting responsibility for their learning lead to the enhancement of self-direction in learning (Candy, 1991; Grow, 1991). The learning activities which were perceived to be self-directed by this study’s eight participants seemed to provide the conditions necessary for students to become active in learning and develop skills and a sense of responsibility for their learning. Many participants claimed that these activities helped the development of self-management, information management and communication skills. Importantly, many students perceived these activities had encouraged them to become proactive in learning, and develop the potential to become self-directed learners.

Findings from these interviews provide an overview of students’ perceptions of factors influencing their self-direction in learning. These results were used to support and complement a more structured testing of relationships between various contributing factors and self-directed learning readiness as illustrated in this study’s conceptual framework. The procedures and results of model testing are described in the next chapter.
Chapter 6: Stage Two Study Results

6.1 Introduction

This chapter presents results of the stage two study. It includes a description of findings relating to pilot testing of the survey questionnaire and a cross-sectional survey of a nursing student sample in Taiwan. This chapter starts with a report on reliability tests of the translated instruments (Section 6.2). The survey results are presented in four parts. The first part (Section 6.3) provides descriptions of participants’ characteristics including their demographic profile and their summarised responses to each variable. The second part (Section 6.4) reports on the test of assumptions for the multiple regression analyses undertaken to ensure the choice of statistical tests was justified. The third part (Section 6.5) presents the outcomes for the bivariate analyses. In this study, t-tests and correlation tests were used to provide an overview of relationships between the independent and dependent variables. The last part (Sections 6.6, 6.7 and 6.8) reports on findings from the multiple regression analyses conducted to answer the research questions for this study. The chapter finishes with a brief summary of major findings from the data analyses.

6.2 Results of Pilot Testing

For the pilot test, instruments were translated and distributed to a Taiwanese nursing student sample comprising 118 second-year students in a 4-year program at one of the participating nursing departments. A total of 81 questionnaires were returned (response rate of 69%), with 40 students also returning a second questionnaire two weeks later (response rate of 34% of the original sample and 49% of those who responded to the first survey).
Data from the questionnaires of the first and second round tests were coded and entered into SPSS data files. Frequency tables were used to check all variables. No invalid values were found in the data set. Scores of items with negative descriptions were reverse scored before the analysis.

The sample of 81 students who participated in the first test includes 72 females and 9 males. The majority of them were between 19 and 21 years old, with a median age of 20 (min, max = 19, 46). The 40 students who returned questionnaires of the second test were all female, with ages ranging from 19 to 32.

6.2.1 Reliability tests

Cronbach’s alpha coefficient was used to assess internal consistency of each scale. Table 6.10 suggests that the alpha values from this pilot test are similar to the original authors’ results, although the coefficients for the CEQ subscales were generally lower than those from Ramsden’s (1991) study. One possible reason is the large difference in sample size. Ramsden’s study recruited 3375 participants, whilst there were only 81 in the present study. Nevertheless, the alpha values are all over 0.65, indicating satisfactory levels of internal consistency for these scales (Hair et al., 2006). Statistical tests of internal consistency and item-to-total correlation were conducted to estimate reliability of the new subscale ‘Learning Resources’ (Hair et al., 2006). Its alpha value of 0.64 and its item-to-total correlations ($r$ coefficients from 0.58 to 0.69) suggested the scale has adequate reliability, although further research may be needed to improve the scale’s internal consistency.
### Table 6.10: Results of internal consistency of scales

<table>
<thead>
<tr>
<th>Scale/ Subscales</th>
<th>Present test</th>
<th>Original authors’ study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 81</td>
<td>n = 627</td>
</tr>
<tr>
<td><strong>Archer (1994)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal Scales</td>
<td>0.85</td>
<td>0.84</td>
</tr>
<tr>
<td>--Mastery</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td>--Performance</td>
<td>0.83</td>
<td>0.80</td>
</tr>
<tr>
<td>--Alienation</td>
<td>0.74</td>
<td>0.70</td>
</tr>
<tr>
<td><strong>Ramsden (1991)</strong></td>
<td>n = 3372</td>
<td></td>
</tr>
<tr>
<td>CEQ</td>
<td>0.86</td>
<td>n/a</td>
</tr>
<tr>
<td>--Clear Goals</td>
<td>0.65</td>
<td>0.80</td>
</tr>
<tr>
<td>--Good Teaching</td>
<td>0.78</td>
<td>0.87</td>
</tr>
<tr>
<td>--Appropriate Assessment</td>
<td>0.68</td>
<td>0.71</td>
</tr>
<tr>
<td>--Emphasis on</td>
<td>0.67</td>
<td>0.72</td>
</tr>
<tr>
<td>Independence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--Appropriate Workload</td>
<td>0.69</td>
<td>0.77</td>
</tr>
<tr>
<td>--Learning Resources</td>
<td>0.64</td>
<td>n/a</td>
</tr>
<tr>
<td><strong>Biggs et al., (2001)</strong></td>
<td>n = 495</td>
<td></td>
</tr>
<tr>
<td>R-SPQ-2F</td>
<td>0.85</td>
<td>n/a</td>
</tr>
<tr>
<td>--Deep approach</td>
<td>0.79</td>
<td>0.73</td>
</tr>
<tr>
<td>--Surface approach</td>
<td>0.77</td>
<td>0.64</td>
</tr>
<tr>
<td><strong>Fisher et al., (2001)</strong></td>
<td>n = 201</td>
<td></td>
</tr>
<tr>
<td>SDLRS</td>
<td>0.92</td>
<td>0.92</td>
</tr>
<tr>
<td>--Self-management</td>
<td>0.78</td>
<td>0.86</td>
</tr>
<tr>
<td>--Desire for learn</td>
<td>0.76</td>
<td>0.85</td>
</tr>
<tr>
<td>--Self-control</td>
<td>0.84</td>
<td>0.83</td>
</tr>
</tbody>
</table>

#### 6.2.2 Test-retest reliability

Forty sets of questionnaires from the second test were coded and matched with the questionnaires from the first test. These data were used for test-retest analysis. Pearson’s correlation coefficient \((r)\) for each scale showed a significant and positive correlation between these two tests.
Paired-sample t-test indicated the mean scores of three scales, the Goal scales, the CEQ and the SDLRS, were not significantly different between the test and retest results, suggesting the instruments were stable across time (Table 6.11). One exception was the R-SPQ-2F whose mean score for retest was significantly higher than the first test mean score (mean difference = 5.5, \( p = .01 \)). The timing for conducting this pilot test may have been a contributor to this increase in scores. The first round test of the questionnaire was administered one week before participants’ final exam, and the second round test was mailed to participants after the exam. By the time participants filled in their second questionnaires, they may have been reflecting on their exam performance and had reflected on the need to adopt particular learning strategies for academic success. These considerations may have influenced the ranking on the R-SPQ-2F items and resulted in the increase in overall scores.

<table>
<thead>
<tr>
<th>Scales</th>
<th>Mean score (test / retest)</th>
<th>Mean difference</th>
<th>Pearson’s r</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal scales</td>
<td>73.63 / 71.26</td>
<td>-2.37</td>
<td>0.70**</td>
<td>-1.89</td>
</tr>
<tr>
<td>CEQ</td>
<td>126.09 / 123.31</td>
<td>-2.78</td>
<td>0.89**</td>
<td>-1.29</td>
</tr>
<tr>
<td>R-SPQ-2F</td>
<td>53.52 / 59.06</td>
<td>5.54</td>
<td>0.55**</td>
<td>3.77*</td>
</tr>
<tr>
<td>SDLRS</td>
<td>139.69 / 141.69</td>
<td>2.00</td>
<td>0.84**</td>
<td>1.16</td>
</tr>
</tbody>
</table>

Note: * \( p < .05 \), ** \( p < .01 \), *** \( p < .001 \)

The absolute test-retest reliability for the scales was visualised by means of Bland-Altman plots with 95% limits of agreement (LOA; mean difference ± 2 SD difference). The straight line on the plot represents the mean score difference of test and retest. The dotted lines represent the LOA. The results showed the test and retest measures of each scale have achieved 95%
agreement (Figure 6.9 - 6.12).

**Figure 6.9: Bland-Altman plot of Goal Scales**

![Bland-Altman plot of Goal Scales](image)

Mean difference of Goal Scales

**Figure 6.10: Bland-Altman plot of CEQ**

![Bland-Altman plot of CEQ](image)

Mean difference of CEQ
6.3 Descriptive Results of Survey

When the reliability of instruments was confirmed, the questionnaires were distributed to a sample of 422 nursing students in their final year of undergraduate study in the three participating departments in Taiwan.

6.3.1 Sample profile

Among the 369 participants (response rate of 87%), 195 were studying the
2-year post-college program and 174 were studying the 4-year post-VHS program. Only four participants were male, which reflects the female dominated nature of the nursing profession in Taiwan. The age range was small. The majority of participants were between 20 and 23 years old, with a median age of 22 (min, max = 20, 36). Only nine participants were at age 24 or above. Participants came from different regions of Taiwan, however, more than two-thirds (69%) were born in the south region. In total, only 9.5% of participants did not possess a nurse licence (Registered Nurse [RN] or Professional Registered Nurse [PRN] licence). The 4-year program has no PRN holders because only those with associate or bachelor degrees are eligible to sit for the PRN exam. More than one half (64.4%) of participants spent an average of one hour or less a day on independent study. Most participants (93%) were school or college leavers who had limited work experience (Table 6.12).

When comparing the characteristics of participants in these two programs, differences are notable although some similarities can be observed, such as gender discrepancy and extent of previous work experience. The majority of participants (80%) in the 2-year program had graduated from 5-year colleges, while 82% of participants in the 4-year program were graduates of vocational high schools. Most participants in the 2-year program were younger than their 4-year program counterparts, with 56% (n = 110) of them being 21 of age and younger, while only 36% (n = 64) of participants in the 4-year program were in this age group. In addition, more participants (n = 84, 44%) in the 2-year program reported spending 5 hours or more a week on independent study than those (n = 42, 26%) in the 4-year program ($\chi^2 = 13.29, p < .001$).
Table 6.12: Demographic background of participants

<table>
<thead>
<tr>
<th></th>
<th>2-year</th>
<th>4-year</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n=195</td>
<td>n=174</td>
<td>n=369</td>
</tr>
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<td>Gender</td>
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<tr>
<td>Male</td>
<td>2</td>
<td>2</td>
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</tr>
<tr>
<td>Female</td>
<td>193</td>
<td>172</td>
<td>365</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>20</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>21</td>
<td>106</td>
<td>59</td>
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</tr>
<tr>
<td>22</td>
<td>66</td>
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<td>144</td>
</tr>
<tr>
<td>23</td>
<td>14</td>
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</tr>
<tr>
<td>24 and above</td>
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<td>4</td>
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<td>Region of birth</td>
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</tr>
<tr>
<td>North</td>
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<td>48</td>
</tr>
<tr>
<td>Middle</td>
<td>37</td>
<td>22</td>
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</tr>
<tr>
<td>South</td>
<td>140</td>
<td>114</td>
<td>254</td>
</tr>
<tr>
<td>East</td>
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<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Prior school</td>
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<tr>
<td>5-year college</td>
<td>156</td>
<td>2</td>
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<tr>
<td>Vocational high</td>
<td>0</td>
<td>143</td>
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<tr>
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<td>PRN</td>
<td>12</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>Both</td>
<td>176</td>
<td>0</td>
<td>176</td>
</tr>
<tr>
<td>Study hours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(per week)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-5</td>
<td>106</td>
<td>122</td>
<td>228</td>
</tr>
<tr>
<td>6 and more</td>
<td>84</td>
<td>42</td>
<td>126</td>
</tr>
<tr>
<td>Working experience</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>182</td>
<td>161</td>
<td>343</td>
</tr>
<tr>
<td>1-year or more</td>
<td>13</td>
<td>13</td>
<td>26</td>
</tr>
</tbody>
</table>

Note: RN = Register Nurse; PRN = Professional Register Nurse

6.3.2 Achievement goals and perceptions of the learning environment

The potential range, actual range, means and standard deviations for scores on each scale of the Goal Scales and the CEQ were calculated and are presented in Table 6.13. A comparison of participants’ actual score range and potential range reveals that the distributions of participants’ scores for all these scales (the Goal Scales and the CEQ), except for the Alienation
Goal scale, are leaning towards the higher end. This suggests that the majority of participants were reporting high mastery and performance goal orientations, and feeling positive towards their current learning environment.

The average item score for each scale was calculated to compare it with the relative ranking. Among the three achievement goals, the Mastery Goal scale obtained the highest average item score of 3.93 on a 5-point scale, indicating that participants in this study were more likely to agree with these items than those of the Performance and Alienation Goal scales. This suggests that undergraduate nursing students’ desire to master knowledge for its own sake may, on average, be stronger than their desire for external rewards. Of the six subscales of the CEQ, measuring different aspects of the learning environment, the Clear Goals scale had the highest average item score, with 3.45 on a 5-point scale of agreement, suggesting that participants generally perceived the learning objectives provided in their programs to be reasonably clear. Items in the Appropriate Assessment scale received the lowest average rating of 2.99, indicating that participants were less satisfied with the way their learning outcomes were assessed.
Table 6.13: Descriptive statistics for students’ achievement goals and perceptions of the learning environment

<table>
<thead>
<tr>
<th></th>
<th>Potential range</th>
<th>Actual range</th>
<th>Scale Mean (sd)</th>
<th>Average item score (sd)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Achievement goals</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mastery</td>
<td>8-40</td>
<td>19-40</td>
<td>31.4 (3.4)</td>
<td>3.93 (0.4)</td>
</tr>
<tr>
<td>Performance</td>
<td>8-40</td>
<td>17-40</td>
<td>30.1 (4.2)</td>
<td>3.76 (0.5)</td>
</tr>
<tr>
<td>Alienation</td>
<td>4-20</td>
<td>4-20</td>
<td>12.0 (3.1)</td>
<td>3.00 (0.7)</td>
</tr>
<tr>
<td><strong>Learning environment</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear Goal</td>
<td>5-25</td>
<td>10-24</td>
<td>17.2 (2.1)</td>
<td>3.45 (0.4)</td>
</tr>
<tr>
<td>Independence</td>
<td>6-30</td>
<td>10-29</td>
<td>18.8 (2.9)</td>
<td>3.14 (0.5)</td>
</tr>
<tr>
<td>Learning Resources</td>
<td>6-30</td>
<td>13-29</td>
<td>20.6 (2.7)</td>
<td>3.43 (0.4)</td>
</tr>
<tr>
<td>Workload</td>
<td>5-25</td>
<td>8-24</td>
<td>15.1 (2.6)</td>
<td>3.02 (0.5)</td>
</tr>
<tr>
<td>Assessment</td>
<td>6-30</td>
<td>11-25</td>
<td>18.0 (2.9)</td>
<td>2.99 (0.5)</td>
</tr>
<tr>
<td>Good Teaching</td>
<td>8-40</td>
<td>11-37</td>
<td>27.5 (4.0)</td>
<td>3.43 (0.7)</td>
</tr>
</tbody>
</table>

6.3.3 Learning approaches and SDL readiness

Table 6.14 presents descriptive results for students’ adoption of learning approaches and SDL readiness. The distributions of actual scores on the Deep Approach and the Surface Approach scales suggest that neither deep nor surface learning strategies were significantly more frequently adopted by participants. On the other hand, the distributions of scores for the SDLRS are leaning towards the higher score end, suggesting that, on average, participants have a strong desire for learning, and are confident about self-management skills and self-control. Of the three subscales for the SDLRS, results of average item scores show that the highest is for the Desire for Learning scale and the lowest for the Self-management scale.
Table 6.14: Descriptive statistics for students’ approaches to learning and SDL readiness

<table>
<thead>
<tr>
<th></th>
<th>Potential range</th>
<th>Actual range</th>
<th>Scale Mean (sd)</th>
<th>Average item score (sd)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Learning approaches</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deep Approach</td>
<td>10-50</td>
<td>14-44</td>
<td>27.4 (5.7)</td>
<td>2.74 (0.6)</td>
</tr>
<tr>
<td>Surface Approach</td>
<td>10-50</td>
<td>11-46</td>
<td>26.2 (5.7)</td>
<td>2.62 (0.6)</td>
</tr>
<tr>
<td><strong>SDL readiness</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-management</td>
<td>40-200</td>
<td>85-187</td>
<td>142.2 (15.2)</td>
<td></td>
</tr>
<tr>
<td>Desire for Learning</td>
<td>13-65</td>
<td>20-59</td>
<td>43.7 (5.6)</td>
<td>3.36 (0.4)</td>
</tr>
<tr>
<td>Self-control</td>
<td>12-60</td>
<td>30-60</td>
<td>44.4 (5.6)</td>
<td>3.70 (0.4)</td>
</tr>
</tbody>
</table>

6.4 Test of Assumptions

It can be observed from the descriptive results that each continuous variable seems to be normally distributed. In order to ensure the appropriate statistical tests are chosen, the following assumptions of bivariate and multivariable analysis were tested prior to inferential analysis.

6.4.1 Normality

The assumption of normality is an important prerequisite in estimations using regression analysis. Normality is better assessed by both statistical tests and graphics (Hair et al., 2006). Statistical assessment of normality is provided by examining values of mean, median, standard deviation, skewness and kurtosis. Graphical assessment of normality involves examination of histograms and normal probability plots. The statistical results and graphics suggested that all continuous variables in this study were reasonably symmetrical. Taking SDLRS for an example, the statistical values suggested a normal distribution of participants’ scores (mean = 142.2, median = 142, SD = 15.2, skewness = 0.01, kurtosis = 0.56). The histogram and normal probability plot also showed symmetrical distribution of data.
(Figure 6.13 and 6.14).

**Figure 6.13: Histogram of SDLRS scores**

![Histogram of SDLRS scores](image)

**Figure 6.14: Normal probability plot of SDLRS scores**

![Normal probability plot of SDLRS scores](image)

### 6.4.2 Linearity and homoscedasticity

Linearity and homoscedasticity between each independent variable and the dependent variable were examined through residual plots. A null plot, with the residuals of a dependent variable against the values of an independent variable are falling randomly and have a relatively equal dispersion along the zero reference line, suggesting that these two assumptions are met (Hair et al., 2006). The residual plots are therefore used in this data set, as results
suggested that the assumptions of linearity and homoscedasticity were met across each independent variable and dependent variable. For example, the scatterplot of standardised residual of SDLRS scores and Good Teaching scores (Figure 6.15) presents the values of these two variables, and suggests a linear relationship with the variances being equally distributed (a null plot). Homoscedasticity also refers to the homogeneity of variances when comparing variables across groups. In this case, the Levene’s test was used to assess the equal variances of variables (Hair et al., 2006), with results indicating that the variances of each variable across 2-year and 4-year students are equal.

Figure 6.15: Residual plot of SDLRS scores with Good Teaching scores

6.4.3 Absence of multicollinearity

Multicollinearity occurs when one independent variable is highly correlated with the other independent variable(s), a situation which may affect the rejection of null hypotheses. An extreme of collinearity/multicollinearity is singularity, in which an independent variable is perfectly predicted (i.e., correlation of 1.0) by another independent variable(s). The correlation matrix for the independent variables (coefficient 0.90 and higher) was examined for identification of substantial collinearity (Hair et al., 2006;
Spicer, 2005). In this data set, the correlation coefficients between all continuous independent variables are not more than 0.60, indicating no significant collinearity existed (Table 6.15). Moreover, Tolerance and variance inflation factor (VIF) statistics were used to assess multicollinearity during the analysis process. Generally, the cut-off point is a Tolerance value smaller than 0.10 and VIF value greater than 10 indicating multicollinearity (Cohen, 2003; Hair et al, 2006). Throughout the regression analysis procedure in this study, Tolerance and VIF values were constantly at the acceptable level (Tolerance range: 0.40 - 0.99; VIF range: 1.01 - 2.48).

Table 6.15: Correlation between continuous independent variables

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>P</th>
<th>A</th>
<th>CG</th>
<th>I</th>
<th>LR</th>
<th>AW</th>
<th>AA</th>
<th>GT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Performance</td>
<td>.57**</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Alienation</td>
<td>-.03</td>
<td>.24**</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Clear Goal</td>
<td>.35**</td>
<td>.29**</td>
<td>-.16**</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Independence</td>
<td>.23**</td>
<td>.13*</td>
<td>-.03</td>
<td>.40**</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Learn Resource</td>
<td>.35**</td>
<td>.16**</td>
<td>-.07</td>
<td>.48**</td>
<td>.46**</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Appr. Workload</td>
<td>.22**</td>
<td>-.02</td>
<td>-.21**</td>
<td>.31**</td>
<td>.32**</td>
<td>.28**</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Appr. Assessment</td>
<td>.09</td>
<td>-.12*</td>
<td>-.42**</td>
<td>.36**</td>
<td>.26**</td>
<td>.33**</td>
<td>.35**</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Good Teaching</td>
<td>.36**</td>
<td>.20**</td>
<td>-.08**</td>
<td>.53**</td>
<td>.60**</td>
<td>.59**</td>
<td>.19**</td>
<td>.37**</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: * p < .05; ** p < .01; *** p < .001 (2-tailed)

Results of these tests suggest the assumptions of normal distribution, linearity, homoscedasticity and the absence of multicollinearity are met in this data set. T-tests, Pearson’s correlation and multiple regression procedures are therefore deemed to be appropriate for analysing these data.
6.5 Associations between Students’ Background, Achievement Goals, Perceptions of the Learning Environment, Learning Approaches and SDL Readiness

Due to the small numbers of participants in three demographic groups (i.e., male 1.1%; work experience 7%; and 20 years of age 2.4%), these characteristics were not included as variables in the analyses. Independent t-tests were used to compare the mean scores for learning approaches and SDL readiness between students in the 2-year and 4-year programs. Participants in the 2-year program reported significantly higher scores for the Deep Approach ($p = .02$), and lower scores for the Surface Approach ($p = .009$) than students in the 4-year program. The mean scores for the SDLRS also revealed that students in the 2-year program reported a better readiness for SDL ($p = .009$) than those in the 4-year program (Table 6.16).

Table 6.16: Association between programs, learning approach and SDL readiness

<table>
<thead>
<tr>
<th></th>
<th>2-year Mean (sd)</th>
<th>4-year Mean (sd)</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning approach</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deep Approach</td>
<td>28.1 (5.7)</td>
<td>26.7 (5.6)</td>
<td>2.37*</td>
</tr>
<tr>
<td>Surface Approach</td>
<td>25.4 (5.6)</td>
<td>27.0 (5.7)</td>
<td>-2.62**</td>
</tr>
<tr>
<td>SDL readiness</td>
<td>144.3 (14.5)</td>
<td>140.0 (15.7)</td>
<td>2.63**</td>
</tr>
</tbody>
</table>

Note: * $p < .05$; ** $p < .01$; *** $p < .001$ (2-tailed)

Pearson’s correlation coefficients were used to briefly assess the relationships between the variables of achievement goals, learning environment, learning approaches and SDL readiness. As Table 6.17 shows, the Mastery and Performance Goals are positively correlated with the Deep Approach and the SDL readiness, indicating participants with higher
mastery or performance goal orientations are more likely to report a higher frequency for adopting deep learning approaches and a higher score for SDL readiness. In contrast, the Alienation Goal scale is associated with the Surface Approach scale, with the direction of association suggesting participants with less interest in the nursing program or learning tasks being more likely to report higher frequency of adopting surface learning strategies.

Results of the correlation analyses show that the scales of Clear Goals, Independence, Good Teaching and Learning Resources are positively correlated with students’ adoption of deep approaches to learning and readiness for SDL. The Appropriate Workload scale is not associated with the Deep Approach, however, it is significantly and positively associated with students’ SDL readiness. The Appropriate Assessment scale is not correlated with either of these outcomes.

The scales of Clear Goals, Appropriate Workload, Appropriate Assessment, Good Teaching and Learning Resources are negatively associated with students’ adoption of surface approaches to learning. This suggests that students who perceive their learning environment to be supportive are less likely to adopt surface learning strategies. The correlation analyses also show that the Deep Approach scale is significantly correlated with the SDLRS, with the direction of association suggesting students who report higher frequency of using deep learning strategies are more likely to report higher SDL readiness.
Table 6.17: Association between achievement goals, learning environment, learning approaches and SDL readiness

<table>
<thead>
<tr>
<th></th>
<th>Deep Approach</th>
<th>Surface Approach</th>
<th>SDL Readiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achievement goals</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mastery</td>
<td>0.30***</td>
<td>NS</td>
<td>0.46***</td>
</tr>
<tr>
<td>Performance</td>
<td>0.17**</td>
<td>NS</td>
<td>0.38***</td>
</tr>
<tr>
<td>Alienation</td>
<td>NS</td>
<td>0.46***</td>
<td>NS</td>
</tr>
<tr>
<td>Learning environment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clear goal</td>
<td>0.18**</td>
<td>-0.29***</td>
<td>0.32***</td>
</tr>
<tr>
<td>Independence</td>
<td>0.38***</td>
<td>NS</td>
<td>0.26***</td>
</tr>
<tr>
<td>Appropriate workload</td>
<td>NS</td>
<td>-0.29***</td>
<td>0.15**</td>
</tr>
<tr>
<td>Appropriate assessment</td>
<td>NS</td>
<td>-0.44***</td>
<td>NS</td>
</tr>
<tr>
<td>Good teaching</td>
<td>0.32***</td>
<td>-0.16**</td>
<td>0.27***</td>
</tr>
<tr>
<td>Learning resource</td>
<td>0.22***</td>
<td>-0.17**</td>
<td>0.25***</td>
</tr>
<tr>
<td>Learning approach</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>--</td>
<td>--</td>
<td>0.48***</td>
</tr>
<tr>
<td>Surface approach</td>
<td>--</td>
<td>--</td>
<td>NS</td>
</tr>
</tbody>
</table>

Note: * p < .05; ** p < .01; *** p < .001 (2-tailed)

In summary, the results of bivariate analyses suggest that students of the 2-year program are more likely to adopt deep learning approaches and have higher level of SDL readiness than those of the 4-year program. In addition, students with higher mastery and performance goal orientations and positive perceptions of the learning environment are more likely to use deep learning strategies and to report higher readiness for SDL. Students with higher alienation goal orientation are more likely to adopt surface learning strategies. The strength of these relationships and the mediating effect of the learning approach on outcomes are examined using multiple regression procedures and results are described in the following sections.
6.6 Factors Influencing SDL Readiness

Students’ SDL readiness is proposed as the product factor in this study’s conceptual framework. It is hypothesised that this outcome is influenced by presage factors, that is, by students’ achievement goals and perceptions of the learning environment. This section presents findings from analyses to test these relationships.

Research question 1:

Do students’ achievement goals and perceptions of the learning environment influence their SDL readiness?

Hierarchical regression procedures were used to determine the contribution of each set of factors (i.e., participants’ background, achievement goals and perceptions of the learning environment) with SDL readiness. The $R^2$ change represents the amount of variance in SDL readiness explained by each set of factors, and $F$ statistics indicate the level of significance. According to previous correlation analyses, the type of nursing program was a factor associated with SDL readiness, therefore, it was converted into dummy coding (2-year = 0; 4-year = 1) and entered in the equation first to control its effect. Students’ achievement goals, consisting of Mastery, Performance and Alienation goal scales, were entered into the model in step two, as these factors also demonstrated associations with SDL readiness. The perceptions of the learning environment, measured by six subscales of the CEQ, were then entered into the model in step three.

Results from the hierarchical regression procedures (Table 6.18) suggest that the model is significant with 25% of the variance in SDL readiness being
explained by these variables. Of all variables, students’ achievement goals present the most significant relationship with SDL readiness, accounting for 22.3% \( F(3, 321) = 31.41, p < .001 \) of the variance. Only 1.7% of the variance is accounted for by program type \( F(1, 324) = 5.45, p = .02 \), and 3.4% by perceptions of the learning environment \( F(6, 315) = 2.44, p = .03 \).

The regression analyses further indicates that only three factors – Mastery, Performance goal orientations and Clear Goals – have significant influences on participants’ SDL readiness (Table 6.18). Among them, the Mastery Goal is the most influential factor. Even when the other determinants were accounted for, students who expressed a stronger focus on mastery goal orientation were more likely to report higher levels of readiness for SDL. In addition, the Performance Goal also significantly and positively influences students’ SDL readiness, with higher scores on the performance goal scale associated with increasing scores on the SDLRS. Of the six factors relating to students’ perceptions of the learning environment, the Clear Goals is the only significant factor positively influencing students’ SDL readiness. That is, students who more strongly agreed that that the learning environment included clear goals were more likely to report higher scores on the SDLRS.
Table 6.18: Hierarchical regression test for SDL Readiness

<table>
<thead>
<tr>
<th>Step</th>
<th>Variable</th>
<th>B</th>
<th>beta</th>
<th>t</th>
<th>R2 change</th>
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<td>Background</td>
<td></td>
<td></td>
<td></td>
<td>.017*</td>
</tr>
<tr>
<td>Step 1:</td>
<td>4-year program</td>
<td>-3.94</td>
<td>-0.13</td>
<td>-2.34*</td>
<td></td>
</tr>
<tr>
<td>Step 2:</td>
<td>Achievement goals</td>
<td></td>
<td></td>
<td></td>
<td>.223***</td>
</tr>
<tr>
<td></td>
<td>4-year program</td>
<td>-2.85</td>
<td>-0.09</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mastery</td>
<td>1.78</td>
<td>0.37</td>
<td>6.52***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performance</td>
<td>0.57</td>
<td>0.15</td>
<td>2.50*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alienation</td>
<td>-0.19</td>
<td>-0.04</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Step 3:</td>
<td>Learning environment</td>
<td></td>
<td></td>
<td></td>
<td>.034*</td>
</tr>
<tr>
<td></td>
<td>4-year program</td>
<td>-2.38</td>
<td>-0.08</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mastery</td>
<td>1.50</td>
<td>0.32</td>
<td>5.18***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performance</td>
<td>0.49</td>
<td>0.13</td>
<td>2.11*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Alienation</td>
<td>-0.10</td>
<td>-0.02</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Clear goals</td>
<td>0.88</td>
<td>0.12</td>
<td>1.98*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Emphasis on Independence</td>
<td>0.53</td>
<td>0.10</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Learning resources</td>
<td>0.11</td>
<td>0.02</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Appropriate workload</td>
<td>0.03</td>
<td>0.01</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Appropriate assessment</td>
<td>-0.14</td>
<td>-0.03</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good teaching</td>
<td>0.05</td>
<td>0.01</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

Overall model: Adjusted $R^2 = .25$, $F_{(10,315)} = 11.86$, $p < .001$

Note: * $p < .05$; ** $p < .01$; *** $p < .001$ (2-tailed)

6.7 Factors Influencing Learning Approaches

Students’ approaches to learning are proposed as process factors in the conceptual framework, and these in turn are suggested to be influenced by presage factors. This section presents the results of testing the relationship between students’ achievement goals, perceptions of the learning environment, and their approaches to learning.

Research question 2:

Do students’ achievement goals and perceptions of the learning environment
influence their approaches to learning?

6.7.1 Achievement goals, perceptions of the learning environment and deep approaches to learning

Similar to the regression procedures for research question 1, three sets of variables – background, achievement goals and perceptions of the learning environment – were entered in three steps. The $R^2$ change and $F$ statistics were used to indicate the variance explained and the level of significance.

The adjusted $R^2$ suggests that the model is significant with 21% of the variance in participants’ deep approaches to learning being accounted for by the three sets of variables. Table 6.19 shows that the type of participants’ program had a minor impact, accounting for only 1.6% ($F_{(1, 335)} = 5.55, p = .02$) of the variance, on participants’ Deep Approach scores. Students’ achievement goal orientations accounted for 9% ($F_{(3, 332)} = 11.08, p < .001$) of the variance, while their perceptions of a supportive learning environment yielded the highest variance (12.9%, $F_{(6, 326)} = 9.14, p < .001$) in explaining students’ adoption of deep approaches to learning. These results suggest students’ decisions to engage in deep learning strategies are significantly influenced by their positive perceptions of the learning environment.

Table 6.19 also suggests that three factors, the type of nursing program, the Mastery Goal and the Emphasis on Independence scales, account for most of the variance in participants’ adoption of deep approaches to learning. Results indicate that participants who were studying in the 4-year program, having adjusted to the other factors in this equation, reported significantly lower Deep Approach scores than their 2-year program counterparts. Higher
scores on the mastery goal orientation were also associated with higher scores on the use of deep learning strategies. Values of standardised beta coefficients indicate that the encouragement of independence, a learning environment characteristic, is the strongest factor influencing students’ adoption of deep approaches to learning. This result suggests that when students perceive they have been encouraged to make independent choices in their learning tasks, they are more likely to adopt learning strategies involving in-depth engagement with course content.

Table 6.19: Hierarchical regression test for Deep Approach to learning

<table>
<thead>
<tr>
<th>Step 1: Background</th>
<th>B</th>
<th>beta</th>
<th>t</th>
<th>R2 change</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-year program</td>
<td>-1.47</td>
<td>-0.13</td>
<td>-2.35*</td>
<td></td>
</tr>
<tr>
<td>Step 2: Achievement goals</td>
<td></td>
<td></td>
<td></td>
<td>.090***</td>
</tr>
<tr>
<td>4-year program</td>
<td>-1.29</td>
<td>-1.11</td>
<td>-2.13*</td>
<td></td>
</tr>
<tr>
<td>Mastery</td>
<td>0.53</td>
<td>0.31</td>
<td>4.77***</td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>-0.02</td>
<td>-0.01</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Alienation</td>
<td>0.03</td>
<td>0.02</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Step 3: Learning environment</td>
<td></td>
<td></td>
<td></td>
<td>.129***</td>
</tr>
<tr>
<td>4-year program</td>
<td>-1.42</td>
<td>-0.12</td>
<td>-2.44*</td>
<td></td>
</tr>
<tr>
<td>Mastery</td>
<td>0.38</td>
<td>0.22</td>
<td>3.37**</td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>-0.02</td>
<td>-0.01</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Alienation</td>
<td>-0.07</td>
<td>-0.04</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Clear goals</td>
<td>-0.09</td>
<td>-0.03</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Emphasis on Independence</td>
<td>0.69</td>
<td>0.35</td>
<td>5.56***</td>
<td></td>
</tr>
<tr>
<td>Learning resources</td>
<td>-0.07</td>
<td>-0.31</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Appropriate workload</td>
<td>-0.13</td>
<td>-0.06</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Appropriate assessment</td>
<td>-0.16</td>
<td>-0.10</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Good teaching</td>
<td>0.17</td>
<td>0.11</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

Overall model Adjusted $R^2 = .21$, $F_{(10,326)} = 9.99$, $p < .001$

Note: * $p < .05$; ** $p < .01$; *** $p < .001$ (2-tailed)
6.7.2 Achievement goals, perceptions of the learning environment and surface approaches to learning

A hierarchical regression procedure, with participants’ program entered in step one, achievement goals in step two, and perceptions of the learning environment in step three, was performed to examine this research question. Results in Table 6.20 suggest these three sets of variables accounted for a significant 32% of the variance in participants’ adoption of surface approaches to learning. Participants’ achievement goals appear to yield the largest influence on students’ engagement of surface learning strategies, which alone explained 22.1% \( F(3, 330) = 32.20, p < .001 \) of the variance. Students’ program and their perceptions of the learning environment only accounted for 2.2% \( F(1, 333) = 7.64, p = .006 \) and 9.6% \( F(6, 324) = 7.89, p < .001 \) respectively of the variance in the Surface Approach score.

The Alienation Goal is the strongest determinant of participants’ adoption of surface learning strategies. Its positive influence on the Surface Approach score indicates that students were more likely to adopt surface learning strategies when they were less interested in the learning tasks. Results further indicate that the factors of Appropriate Assessment, Clear Goals and Appropriate Workload were negatively associated with the reported Surface Approach scores. These findings suggest that when students perceived a learning environment provided lower level of support in terms of clear direction in learning, appropriate assessments for their learning outcomes, and reasonable workload, they tended to use surface learning strategies more frequently.
Table 6.20: Hierarchical regression test for Surface Approach to learning

<table>
<thead>
<tr>
<th>Step 1: Background</th>
<th>B</th>
<th>beta</th>
<th>t</th>
<th>( R^2 ) change</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-year program</td>
<td>1.75</td>
<td>0.15</td>
<td>2.77**</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 2: Achievement goals</th>
<th>B</th>
<th>beta</th>
<th>t</th>
<th>( R^2 ) change</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-year program</td>
<td>1.36</td>
<td>0.12</td>
<td>2.34*</td>
<td></td>
</tr>
<tr>
<td>Mastery</td>
<td>-0.24</td>
<td>-0.14</td>
<td>-2.37*</td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>0.12</td>
<td>0.08</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Alienation</td>
<td>0.82</td>
<td>0.44</td>
<td>8.77***</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Step 3: Learning environment</th>
<th>B</th>
<th>beta</th>
<th>t</th>
<th>( R^2 ) change</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-year program</td>
<td>0.85</td>
<td>0.07</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Mastery</td>
<td>-0.09</td>
<td>-0.05</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td>0.09</td>
<td>0.06</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Alienation</td>
<td>0.56</td>
<td>0.30</td>
<td>5.80***</td>
<td></td>
</tr>
<tr>
<td>Clear goals</td>
<td>-0.38</td>
<td>-0.14</td>
<td>-2.4*</td>
<td></td>
</tr>
<tr>
<td>Emphasis on Independence</td>
<td>-0.08</td>
<td>-0.04</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Learning resources</td>
<td>-0.01</td>
<td>-0.01</td>
<td>NS</td>
<td></td>
</tr>
<tr>
<td>Appropriate workload</td>
<td>-0.33</td>
<td>-0.15</td>
<td>-2.81**</td>
<td></td>
</tr>
<tr>
<td>Appropriate assessment</td>
<td>-0.41</td>
<td>-0.20</td>
<td>-3.55***</td>
<td></td>
</tr>
<tr>
<td>Good teaching</td>
<td>-0.07</td>
<td>-0.05</td>
<td>NS</td>
<td></td>
</tr>
</tbody>
</table>

Overall model: Adjusted \( R^2 = .32, F_{(10,324)} = 16.71, p < .001 \)

Note: * \( p < .05 \); ** \( p < .01 \); *** \( p < .001 \) (2-tailed)

6.8 The Mediating Effect of Approaches to Learning

The above analyses identified significant relationships exist between students’ achievement goals, perceptions of the learning environment, learning approaches and SDL readiness. In this section, an account is given of regression procedures used to examine the mediating effect of learning approaches as proposed in the conceptual framework. According to the statistical methods described in Chapter Four, three requirements are needed to test the mediating effect of learning approaches: (1) the presumed mediators (deep and surface approaches to learning) are significantly related
to SDL readiness; (2) achievement goals (or perceptions of the learning environment) are significantly related to the presumed mediators; and (3) achievement goals (or perceptions of the learning environment) are significantly related to SDL readiness, yet this significance decreases when the mediator is entered into the equation. These requirements form the basis of testing procedures and the selection criteria for eligible factors in the mediating equation.

6.8.1 Approaches to learning and SDL readiness

The first requirement to test the mediating effect of learning approaches is that they have to be significantly correlated with SDL readiness. To examine this requirement, previous hierarchical regression procedures were followed. Three sets of variables (students’ program, achievement goals and perceptions of the learning environment) were entered into the equation in three steps to control the effect. Approaches to learning were then entered in step four.

Results show that, after the other factors are accounted for, approaches to learning are significantly correlated with students’ SDL readiness, accounting for 14.3% \( (F_{(2, 299)} = 35.91, p < .001) \) of the variance in students’ SDL readiness. The Deep Approach is significantly and positively correlated with SDLRS, while the Surface Approach is not (Table 6.21). Therefore, only the Deep Approach is qualified as a mediator in this model.
Table 6.21: Regression test for relationship between learning approaches and SDL readiness

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>beta</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep Approach</td>
<td>1.19</td>
<td>0.45</td>
<td>8.47***</td>
</tr>
<tr>
<td>Surface Approach</td>
<td>-0.15</td>
<td>-0.06</td>
<td>NS</td>
</tr>
</tbody>
</table>

Adjusted $R^2 = .143$, $F (2, 299) = 35.91$, $p < .001$

Note: * $p < .05$; ** $p < .01$; *** $p < .001$ (2-tailed)

6.8.2 Mediating effect of learning approaches on the relationship between achievement goals and SDL readiness

Research question 3:
Do students’ approaches to learning (deep approaches) mediate the relationship between students’ achievement goals and their SDL readiness?

The regression results reported earlier in this chapter suggest that the Mastery and Performance goal orientations are both significant factors influencing students’ SDL readiness. To further understand the complex influences of motivation on student learning, the interaction effect of the Mastery and the Performance orientations was examined according to propositions from previous research of achievement goal theory (Archer, 1994; Pintrich, 2000a; Wolters, 2004). This procedure involves creating four groups based on median splits: a median split on the Mastery Goal scale and on the Performance Goal scale. The two median splits created four groups: (1) students high in both Mastery and Performance Goals; (2) students high in the Mastery Goal but low in the Performance Goal; (3) students low in the Mastery Goal but high in the Performance Goal; and (4) students low in both Mastery and Performance Goals.
Chapter 6

The group of students who endorsed high on both Mastery and Performance orientations reported the highest average scores of SDL readiness (mean = 149.9, SD = 14.9), compared with other groups (high in Mastery = 146.6, SD = 17.2; high in Performance = 138.2, SD = 11.6; low in both = 134.3, SD = 11.3). Analyses further suggest that there is a significant main effect for the Mastery Goal ($F_{(1,338)} = 53.75, p < .001$) and a significant but small main effect for the Performance Goal ($F_{(1,338)} = 4.84, p = .03$) on students’ SDL readiness. However, no interaction effect was found between the Mastery and Performance goal orientations. This result suggests that students’ SDL readiness is most likely to be influenced by their endorsement of mastery goal orientation, while the additional high performance orientation has little impact on their SDL readiness.

Given that the Mastery Goal is the main determinant of students’ SDL readiness, it is considered as the independent variable in the mediating equation. Students’ SDL readiness was regressed on the Mastery Goal after the background variable (program type) was entered and controlled in the first step. Results suggest this relationship is significant (beta = .46; $p < .001$). The mediator, the Deep Approach, was then entered into the equation resulting in a change of the significance between the Mastery Goal and SDL readiness (beta = .38; $p < .001$). The decrease of beta value is considered evidence of a mediating effect. The beta value decreased 0.08 of a point after the mediator was entered into the equation, confirming that students’ adoption of deep learning approaches mediates the relationship between their mastery goal orientation and SDL readiness (Figure 6.16).
Figure 6.16: Mediating effect of Deep Approach between mastery goal and SDL readiness

![Diagram showing mediation effect]

Note: *** $p < .001$; $\rightarrow$ direct effect; $\Rightarrow$ mediating effect

6.8.3 Mediating effect of approaches to learning on the relationship between perceptions of the learning environment and SDL readiness

Research question 4:

Do students’ approaches to learning (deep approaches) mediate the relationship between students’ perceptions of the learning environment and their SDL readiness?

Results of regression analyses in sections 6.7 and 6.8 suggest that students’ perceptions of the learning environment are significantly correlated with students’ learning approaches and SDL readiness. However, no single factor was identified to be significant to both learning approaches and SDL readiness. For example, the factor Emphasis on Independence is a significant determinant of student’s adoption of deep approaches to learning, but not for SDL readiness, whereas the Clear Goals is significantly related to SDL readiness but not to deep approaches to learning. Therefore, the sum of the CEQ scores was used as the independent variable, representing students’ overall perception of the learning environment. Regression analyses suggest that the overall perception of the learning environment is significantly
associated with the Deep Approach ($R^2$ change = .08; $p < .001$) and with SDL readiness ($R^2$ change = .09; $p < .001$), indicating the requirements for testing mediating effect are met.

To test the mediating effect, students’ SDL readiness was firstly regressed on the overall scores of the CEQ, after students’ nursing program was entered and controlled in the first step. This relationship is significant with a beta value of 0.30 ($p < .001$). When the Deep Approach was entered into the equation, the beta value of the relationship between the learning environment and SDL readiness decreased (beta = .15, $p < .001$). This reduction of beta value suggests that students’ adoption of deep learning strategies mediates the relationship between their perceptions of the learning environment and their SDL readiness (Figure 6.17).

**Figure 6.17: Mediating effect of Deep Approach between perceptions of the learning environment and SDL readiness**

![Diagram showing mediation](image)

Note: *** $p < .001$; direct effect; mediating effect

In summary, when SDL readiness was regressed on the Mastery Goal and the Deep Approach, the beta value decreased 0.08 of a point (from 0.46 to 0.38) after the mediator was entered into the equation. Similarly, the beta value reduced by 0.15 of a point (from 0.30 to 0.15) when the Deep Approach was entered into the regression equation for students’ overall...
perceptions of the learning environment and their SDL readiness. These reductions of beta values suggest that students’ adoption of deep learning strategies mediates between their mastery goal orientation and SDL readiness, as well as between their perceptions of the learning environment and SDL readiness.

6.9 Summary

Four sets of instruments were selected to measure the main factors of this study: students’ achievement goals, perceptions of the learning environment, learning approaches and SDL readiness. Except for one new subscale developed from findings of qualitative analysis of semi-structured interviews in stage one, these instruments had previously been validated and tested for reliability and validity studies (see Chapter Four). For this study, these instruments were translated and tested with a sample of undergraduate nursing students in Taiwan. Data from the pilot testing were examined using Cronbach’s alpha (internal consistency), Pearson’s product moment correlation, paired-sample t-test, and Bland-Altman plots. Results of these analyses suggested the translated instruments are reliable and reasonably stable across time. They were then used in a cross-sectional survey with a large sample of nursing students in Taiwan.

Findings from the survey suggest the conceptual framework for this study is supported, with significant relationships existing between students’ achievement goals, perceptions of the learning environment, learning approaches and SDL readiness. Findings suggest that students’ achievement goals and their perceptions of the learning environment explained a considerable amount of variance in their adoption of learning approaches
and SDL readiness.

Firstly, a significant relationship was identified between the Mastery Goal, the Deep Approach scales and SDL Readiness. This result suggests that students who are motivated by their interest in nursing or learning tasks are more likely to employ deep learning strategies and have higher level of SDL readiness. On the other hand, the significant relationship between the Alienation Goal and the Surface Approach scales indicates that students who have little interest in studying nursing or in their learning tasks are more likely to adopt surface learning strategies.

Secondly, students’ perceptions of a supportive learning environment appear to be important to students’ adoption of learning approaches and SDL readiness. The survey results identified a significant and positive relationship between the Emphasis on Independence and the Deep Approach scales. Perceptions of appropriate assessment, appropriate workload and clear goals were negatively associated with the Surface Approach. Results also suggest that the perception of clear goals is a significant determinant of students’ SDL readiness.

Finally, the results support the proposed relationships derived from this study’s conceptual framework that greater use of a deep approach to learning directly influences students’ SDL readiness. The Deep Approach also mediates the relationship between students’ mastery goal orientation and SDL readiness, and between perceptions of the learning environment and SDL readiness. In the next chapter, these findings are discussed in light of previous research work.
Chapter 7: Discussion and Conclusion

7.1 Introduction

In this final chapter, findings of the present study are discussed and conclusions drawn. The first section of this chapter (Section 7.2) presents a summary of the present study. Descriptions of the major findings from this study are provided and discussed in the second section (Section 7.3). A number of theoretical and practical implications for enhancing the development of students’ SDL readiness are suggested in the third part of this chapter (Section 7.4). As with most studies, this study has its limitations. The last section (Section 7.5) of this chapter outlines the study’s limitations, and several recommendations for further research investigating students’ SDL readiness are suggested.

7.2 Summary of the Study

Fostering students to become self-directed learners is an important goal of nursing education in Taiwan (Chung, 2004; CRDC, 2003). The aim of this study was to investigate factors influencing SDL readiness of Taiwanese nursing students. A conceptual framework based on theories of student approaches to learning was constructed to guide this study. Due to limited information available in relation to the SDL readiness of Taiwanese nursing students, this study employed a two-staged mixed-method design to obtain a better understanding of nursing students’ experiences with learning activities encouraging self-direction in their undergraduate programs and their perceptions of factors influencing the development of SDL readiness.

Stage one of the present study was a qualitative analysis using
semi-structured interview to explore students’ experiences with learning activities which they perceived to be self-directed in their undergraduate programs. Eight students from three participating nursing departments were interviewed. Findings from this stage reveal that participants perceived a shift in teaching and learning styles between their previous nursing programs and the university. The more frequent use of student-directed learning activities, in which students were encouraged to be active and to take responsibility for their learning tasks, was one of the changes in teaching and learning approaches perceived by participants. Participants further suggested a number of factors that influenced the outcomes of these learning activities, including teacher-student interaction and facilitation processes. Findings from the interview were consistent with various theories about SDL which suggest that the provision of support and appropriate facilitation strategies from the teacher are important for encouraging students to become self-directed in learning (Grow, 1991; Knowles, 1983; Pilling-Cormick, 1997; Wilcox, 1996).

Stage two of this study used a quantitative approach consisting of two phases: instrument pilot testing and a cross-sectional survey. In the first phase, the instruments were translated into Chinese through a rigorous translation process and tested with a convenience sample of nursing students in Taiwan. Results indicated the translated instruments were reliable and stable. The second phase, a cross-sectional survey, was conducted to examine the conceptual framework of this study. With a response rate of 87%, 369 undergraduate students from the participating nursing departments completed the questionnaire. Results of data analysis provides support for the conceptual framework proposed for this study, suggesting that students’
achievement goals and their perceptions of the learning environment significantly influence their adoption of learning approaches and the development of SDL readiness. The major findings are discussed in the next section.

7.3 Major Findings

7.3.1 SDL experiences of undergraduate nursing students in Taiwan

The interview results reveal that students generally perceived the learning and teaching environment in the university placed a greater emphasis on students being active and independent in learning compared to their previous school-based nursing programs. Alongside lectures, teachers in the university introduced a number of learning activities which students perceived were designed to encourage their self-direction in learning. These activities were perceived by students as being characterised by features including students being responsible for choosing a learning topic, acquiring relevant information, setting up a personal (or group) plan of study and/or evaluating learning outcomes.

Similar to findings from previous studies of students’ perceptions of learning activities designed to promote SDL (Hewitt-Taylor, 2001, 2002; Lunyk-Child, 2001), participants in this study generally expressed that undertaking these SDL activities was often associated with considerable confusion and frustration. Students’ comments suggested that while university teachers may acknowledge and expect students to be independent and active during the process of these learning activities, the teacher continued to play a major role in decision making about what students are to learn and how they have to learn it. As such, while these activities may be
introduced to encourage students to be self-directed, students perceived certain features of the learning environment and teacher-student interaction were important to their experience. Furthermore, in reality, students described how choices of topic were often limited by the subject content, and results of these activities were usually evaluated by the teacher. Such findings suggest that student-directed learning activities for this sample were semi-autonomous in nature, with the teacher often playing an important role in influencing the learning process and outcomes.

The description of participants’ experiences of learning activities which they perceived to be self-directed in their undergraduate programs provides some insights into the teaching and learning practices in the three participating nursing departments, and factors which may influence these experiences. Participants described situations which enhanced or hindered outcomes of these learning activities, emphasising the importance of teacher-student interaction to the process of SDL. In particular, students described that teachers who were approachable and available for discussions were more likely to encourage them to gain confidence in learning and to develop skills important to SDL, such as self-monitoring and self-management.

Participants further identified other environmental factors which they believed to be important to the success of these SDL activities. These included effective facilitation strategies, such as giving clear directions, enabling independent choices, providing timely and constructive suggestions and ensuring appropriate workload and sufficient learning resources. Participants suggested that providing clear directions for learning activities, for example, specific learning objectives and explicit marking
criteria, were important to guide them through the process of planning and self-evaluation of SDL activities. Of some interest was the finding that while students described the importance of clear directions, they also expressed a desire to be able to make independent choices within the broad scope of learning tasks set by the teacher.

These emphases on the importance of a supportive learning environment are consistent with results of previous studies (Lea et al., 2003; Lizzio & Wilson, 2005; Nolan & Nolan, 1997a). For example, a focus-group study undertaken by Lea et al. (2003) explored issues of learning and teaching within the higher education environment. In this study, students identified a number of factors inhibiting their learning when undertaking student-directed learning activities. These factors included unapproachable lecturers, being left to themselves without much guidance from the lecturer, anxiety about what was expected from the teaching staff, a lack of flexibility or choice in module selection, and limited resources.

In Lizzio and Wilson’s (2005) study, students perceived similar environmental issues as being influential to their satisfaction with and outcomes from student self-managed learning activities. The researchers found that the provision of clear working processes (clear guidelines and procedures, clarity of staff’s roles), staff availability (staff are there when students need them), and resources and skills (sufficient resources and skills to complete the tasks) as being a part of students’ major concerns regarding the learning process associated with self-managed learning activities.

Nolan and Nolan’s (1997a) survey indicated nursing students expressed
similar concerns about teaching and learning during student-directed learning activities. Nursing students in this study expected the teacher to take initial lead of SDL activities, in terms of determining the goals and skills that students need to learn. During the learning process, students expected that they could be encouraged to make independent choices within a broad framework. They also emphasised that a learning climate where students’ interests and opinions are valued is important to ensuring satisfactory experiences with these learning activities.

Some participants further described that, while gaining a university degree may be the most obvious motive for completing every learning task, their interest in nursing or the learning topic, as well as their self-expectation about learning more about nursing have influenced their learning processes and outcomes. Such comments reflect a complex combination of both intrinsic and extrinsic motivation that may need to be considered in understanding factors which influence students’ performance with self-directed learning activities (Regan, 2003).

Importantly, interview findings further suggested that participants perceived generic skills, such as self-management, information management and communication skills, had improved after being involved in activities perceived to be self-directed in nature. Participants described that such activities had provided them with opportunities to effectively plan their work, retrieve information and integrate it into reports, and present reports in oral and written forms. Along with these study skills, students identified that their communication skills, including skills in negotiation and managing conflicts, had also improved. Some participants further expressed
that this improvement of learning skills had encouraged them to become more proactive in learning and to develop a more positive attitude towards learning.

The skills and attributes described above reflect important outcomes for higher education. The need to develop graduates who have a range of transferable generic skills, such as abilities to plan work, to work within a team and to communicate well in writing and verbally, are important to enabling students to apply the knowledge learned in university to the work environment (CRDC, 2003; Wilcox, 1996; Wilson & Lizzio, 1997). Importantly, these attributes also reflect characteristics of self-directed learners who are described as being able to manage their own learning and active in learning (Areglado et al., 1996; Candy, 1991; Fisher et al., 2001; Guglielmino, 1977).

Although SDL has been a popular research concept in nursing education, little empirical evidence is available to substantiate its benefit. Hewitt-Taylor (2001) indicated that both nursing students and teachers recognise the value of SDL but did not say what this value is. Pedley and Arber (1997) conducted an exploratory study in the UK evaluating the effectiveness of a SDL module. A convenience sample of 135 students completed a questionnaire with fixed choice and open-ended questions, which was also supplemented by group discussion and feedback. Students in this study reported the benefit of undertaking the SDL module including that students have more choices, are more autonomous and responsible for their learning. While this study may have briefly addressed the value of implementing learning activities designed to promote students’
self-direction, it did not clearly articulate the attributes and skills that students obtained from engaging in these learning activities.

In summary, participants in the stage one interview study, on the whole, were prepared and able to accept responsibility for their own learning and believed the SDL activities introduced by their teachers were beneficial to the development of essential learning skills. However, they expressed concerns that certain factors could negatively impact on their experiences of these learning activities, including teacher-student interaction, teachers’ facilitation processes and adequacy of learning resources. Students’ comments reflected an expectation that they should be given clear directions and guidance, and that opportunities to make independent choices within the limits of academic requirements were important. These concerns confirm claims made by previous researchers that the concept of SDL in formal education settings should be treated as ‘freedom with boundaries’ (Iwasiw, 1987; Nolan & Nolan, 1997a, 1997b). That is, students’ self-direction may be limited by the boundaries of the scope of a study program, however, the boundary should be made explicit and be clearly understood by both teachers and student. The findings of this study support the view that, when such boundaries are explicit, students can be encouraged to exercise their full extent of self-direction (Livingstone & Lynch, 2000; Nolan & Nolan, 1997a, 1997b; Orsmond et al., 2004).

7.3.2 Achievement goals, perceptions of the learning environment, learning approaches and SDL readiness of Taiwanese nursing students

The survey of 369 nursing students in Taiwan provides a description of their
achievement goal orientations, perceptions of the learning environment, approaches to learning and SDL readiness. Results identified that students generally reported medium to high levels of mastery and performance goal orientations. The tendency towards high achievement motivation may be a result of the competitive university entry system in Taiwan where entry into an undergraduate program is dependent on students’ previous academic performance or results of the entrance exam (Wang & Yeh, 2005). Presumably, students who decided to pursue further study in nursing and successfully entered the university are likely to have higher achievement motivation.

The mean scores for participants’ achievement goals were compared with data from previous studies using the same instrument to gain a further understanding of participants’ features. Participants in the present study rated the Mastery and the Performance Goal scales with average scores of 31.4 and 30.1, which are significantly higher than the mean scores of 29.3 ($t = 11.74$, $p < .001$) and 27.0 ($t = 14.39$, $p < .001$) obtained from a sample of 266 educational psychology students in an Australian university (Archer, 1994). These results may suggest that participants of the present study endorse stronger mastery and performance goal orientations than Australian university students. However, this result should not be seen as conclusive as the comparison data may not represent Australian students’ characteristics at the present time.

Students in this study reported moderate levels of satisfaction with their learning environment. Among the six domains of the CEQ, nursing students were least satisfied with assessment methods, indicating they perceived the
assessment of learning outcomes to be focused on testing facts and rote learning skills, instead of a comprehensive understanding of the learning content. These findings are supported by comments made by some students during interviews that exams were often the major and the most important assessment item in their curriculum. For example, some participants said that after they completed SDL activities, they still had to prepare for exams by “picking up the examinable content and trying to memorise it all” (Student G). Such comments reflect negative views about assessment methods persist, with students reporting that they believed that good memory and working hard around exam times was what was needed to get through their course.

The mean scores for students’ perceptions of the learning environment were compared with data from a study by Sadlo and Richardson (2003) who investigated 225 university students of occupational therapy from Australia, Belgium, Canada, England, Sweden and the United States. Results indicate that participants in the present study reported significantly higher scores on the scales of Clear Goals ($t = 25.81, p < .001$), Good Teaching ($t = 35.48, p < .001$), Independence ($t = 12.42, p < .001$), and Appropriate Workload ($t = 9.95, p < .001$). Only the score on the Appropriate Assessment scale is significantly lower than the comparison sample ($t = -19.14, p < .001$). These results may suggest that participants of the present study have stronger and positive perceptions about their learning environment than average when compared to university students from a number of Western countries. However, this result should be applied with caution due to the different background and professions of the comparison groups.
Students in the present study described themselves adopting deep learning strategies slightly more frequently than surface strategies, although this difference was not statistically significant. They also reported medium to high scores of SDL readiness. However, in comparison with data from other studies using the same instruments, these scores are lower than those of nursing students from other countries. For example, the mean scores for learning approaches were compared to data from a study of 237 university nursing students in Hong Kong (Tiwari et al., 2006). Results show that participants in the present study reported significantly lower scores for the Deep Approach than the Hong Kong sample ($t = -5.25, p < .001$), while no notable difference was found for the Surface Approach scores between the two samples. In addition, participants’ mean scores for the SDLRS were compared with data from a sample of 201 undergraduate nursing students in Australia (Fisher et al., 2001). Participants in the present study scored significantly lower than those in Fisher et al.’s (2001) on scales of Desire for Learning ($t = -11.24, p < .001$) and Self-control ($t = -14.32, p < .001$), resulting in a significantly lower score on the overall SDLRS ($t = -10.18, p < .001$). These results may suggest that the average score for use of Deep Approaches to learning among nursing students in the present study is significantly lower than that of a Hong Kong nursing student sample (Tiwari et al., 2006), and that the average SDLRS score is significantly lower than that of an Australian nursing student sample (Fisher et al., 2001). However, these results should be interpreted with caution, as the data were collected at different time for different research purposes.

It is acknowledged that no definitive conclusions can be drawn from comparisons of scores obtained in this study and those reported with other
study samples. However, such data does raise important questions for further research, as it may provide some insights into the different learning contexts in Taiwan, compared to those in Hong Kong and in Australia. For example, despite recent efforts to reform curriculum in Taiwan, Taiwanese nursing curricula are often filled with lectures and intensive periods of clinical practice (CRDC, 2003). Such crowded curricula may result in limited time for students to engage in deep learning approaches. Such busy schedules may allow limited opportunity for students to think about their learning needs and to pursue their own study interests. Indeed, the literature suggests that students with Chinese cultural influences are more likely to see teachers as authority figures, which may result in them feeling more comfortable following teachers’ instruction rather than being self-directed and independent in learning (Chan, 1999; Cortazzi & Jin, 2001; Ho, 2001).

Findings from the stage one interview study suggest that while participants were generally positive about self-directed learning, they also preferred having clear directions from the teacher, and that this was important to the SDL process. While it is not possible to comment on whether such comments are unique to this group, it is possible that the nursing students in this study continue to rely on teachers’ instruction.

7.3.3 Relationships between achievement goals, learning approaches and SDL readiness

The survey results reveal that students’ motivation had the most significant influence on their SDL readiness, accounting for 22% of the variance. This result provides empirical evidence supporting the important role of motivation in self-direction in learning (Brookfield, 1986; Garrison, 1997; Regan, 2003). More specifically, nursing students in this study who
expressed a greater orientation to mastery goal are more likely to report higher SDL readiness. A significant and positive relationship was also established between having a performance goal orientation and SDL readiness, however, the strength of this relationship was less strong than that of the mastery orientation.

No research investigating relationships between achievement goals and SDL readiness was found. Previous research has mainly focused on the associations between students’ achievement goals and quantitative learning outcomes, such as academic results (Ironsmith et al., 2003; Wolters; 2004). These studies have suggested that students who endorse mastery goals are more likely to receive higher grades than those endorsing performance goals (Ironsmith et al., 2003; Linnerbrink, 2005).

Some researchers have suggested that, theoretically, endorsing a performance goal orientation is beneficial to student learning, especially when a mastery goal orientation is also endorsed (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002). The findings from interviews with students in the present study also indicate that a combination of intrinsic and extrinsic motivations may encourage students towards better performance. Previous quantitative studies have not supported the view that students who adopted multiple goal patterns report higher academic results than those who endorsed mastery goal only (Ironsmith et al., 2003; Pintrich, 2000a; Wolters, 2004). In the present study, an interactive effect of performance and mastery goals on students’ SDL readiness is also absent, suggesting that nursing students in this study who strongly endorsed both mastery and performance goals did not display better SDL readiness than that which can
be explained by the effect of mastery orientation alone. This result therefore suggests students’ mastery goal orientation is likely to be a more important factor influencing SDL readiness.

The survey results also demonstrate that students’ achievement goals significantly influence their adoption of learning approaches. Nursing students in this study who expressed stronger mastery orientation to learning are likely to adopt deep learning strategies more frequently than others. These findings support previous studies in this area that students with stronger mastery goal orientation are more likely to use meta-cognitive learning strategies, whereby they are able to check comprehension throughout the learning process or monitor their own learning progress (Archer, 1994; Perrot et al., 2001; Wolters, 2004).

In this study, students’ endorsement of performance goals was not associated with either deep or surface learning approaches. These findings are in line with prior evidence that motivation focused on rewarding or doing better than others neither promotes nor interferes with students’ reported use of deep learning strategies (Pintrich, 2000a; Wolters, 2004). Furthermore, the present results did not support the view which suggests that students’ motivation to out-perform others may promote surface learning strategies (Dweck & Leggett, 1988; Ironsmith et al., 2003).

A significant relationship between students’ academic alienation goal orientation and the use of surface learning strategies is established in this study, indicating that nursing students whose interests lie outside of the nursing profession are more likely to exercise limited effort in the learning
process and adopt surface learning strategies, such as reproducing knowledge and memorising facts. No research investigating relationships between students’ achievement goals and surface learning approaches was found in the literature. This result provides evidence that students’ academic alienation goal orientation is associated with the adoption of surface learning approaches.

### 7.3.4 Relationships between perceptions of the learning environment, learning approaches and SDL readiness

The previous section indicates that students’ achievement goals are significant factors influencing their SDL readiness. Students’ perceptions of a supportive learning environment also made a significant but rather small contribution to their reported SDL readiness, accounting for only 3% of the variance. Of the six domains of the learning environment assessed in this study, students indicated that they may develop better readiness for SDL when the learning goals and standards are clear to them. This finding supports Regan’s (2003) study which suggested nursing students believe a clear direction and guidance motivate them towards SDL.

Students’ perceptions of their learning environment may be a weak predictor of SDL readiness, however, they are the most significant contributors to students’ reported use of deep learning strategies, accounting for almost 13% of the variance. These findings provide support for previous studies which have suggested that students who perceive their learning environment to consist of good teaching, adequate resources, appropriate assessment and workload report themselves as more likely to adopt meaning-based learning strategies (Diseth et al., 2006; Lizzio et al., 2002; Richardson, 2005; Sadlo
Consistent with previous research (Lizzio et al., 2002), the present study also suggests that, of the six aspects of a university environment, students’ perception of an emphasis on independence is the strongest predictor of deep learning approaches. Nursing students in this study appeared to be saying that a learning environment offering independent choices about learning tasks and freedom to develop personal academic interests is most likely to encourage their adoption of deep learning strategies.

Two aspects of the university learning environment, appropriate workload and assessment, were significant but negative predictors of student adoption of surface approaches to learning. This result indicates that nursing students in this study are more likely to adopt reproductive and rote learning strategies when they perceive the learning task to be packed and the assessment requirements that are focused on memorising. These two domains, appropriate workload and assessment, have consistently shown significant relationships with the surface approach to learning in previous studies (Diseth et al., 2006; Lizzio et al., 2002). This consistent finding may suggest that these two areas could be a focus for strategic intervention if nurse educators are seeking to discourage students’ adoption of surface learning approaches.

Finally, perceptions of good teaching and learning resources were not significant predictors of either SDL readiness or approaches to learning in this study, suggesting these two aspects of the learning environment have limited impact on these outcomes. This finding differs to comments from students in the interview phase of this study, and to previous studies which
have reported that good teaching is a strong predictor of students’ deep approaches to learning (Diseth et al., 2006; Lizzio et al., 2002).

Particular considerations should be given when interpreting these results regarding good teaching and learning resources. Firstly, it is possible that good teaching and learning resources are more likely to correlate with conventional learning outcomes such as academic performance. Previous research suggested that students’ perceptions of good teaching are positively correlated with their satisfaction with learning experiences and academic achievement (Diseth et al., 2006; Lizzio et al., 2002; Richardson, 2005).

Secondly, the context of good teaching reflects the quality of the basic teaching-learning transaction between teachers and students. This involves reciprocal transactions of teachers giving (clear explanation and helpful feedback) and seeking of information (interest in students’ opinion and difficulties), within an intrinsically motivating context (work to make subjects interesting and to motivate students to achieve their best) (Lizzio et al., 2002). These transactions may encourage students’ interest to learn, as previous studies have pointed out, good and enthusiastic lecturers motivate students to be self-directed in learning (Hodgson, 1997; Regan, 2003). Results from this study suggest a positive relationship existing between students’ perceptions of good teaching and their mastery goal orientation, indicating that students who perceived their teachers as being supportive and good at teaching are likely to report higher mastery goal orientation. It is possible that good teaching may have a direct impact on students’ motivation to learn, which indirectly influences students’ adoption of deep learning strategies and the development of SDL readiness.
7.3.5 Relationships between approaches to learning and SDL readiness

Results of this study provide empirical evidence to support Candy’s (1991) argument that a relationship exists between deep approaches to learning and self-direction in learning. Deep learning approaches significantly influenced the SDL readiness of this study’s participants, accounting for 14% of the variance, suggesting that nursing students who adopt deep learning strategies are more likely to be familiar with the skills of SDL and more prepared to be self-directed in learning. These results are consistent with other research findings showing adoption of a deep learning approach to be a significant predictor of students’ academic performance and the development of generic skills (Lizzio et al., 2002).

Current findings suggest that a surface approach to learning does not correlate with students’ SDL readiness. This non-significant relationship may be attributable to the nature of learning outcomes. Quantitative learning outcomes (e.g., course grades), where the assessment procedures are related more strongly to the memorisation of knowledge and facts, may be more likely to be influenced by a surface learning approach than affective and qualitative learning outcomes (e.g., course satisfaction and SDL readiness). Such arguments are supported by research findings which suggest that surface approaches to learning are associated with students’ course grades, yet not related to their reported development of generic skills (Lizzio et al., 2002).

7.3.6 Mediating role of deep approaches to learning

The results discussed above indicate the deep approach to learning, as a
process factor in this study’s conceptual framework, is associated with presage factors (students’ motivation and perceptions of the learning environment) and the product factor (SDL readiness). Given these results, this study further provides evidence that a deep learning approach mediates between the presage and product factors examined in this study. That is, students’ achievement goals and perceptions of the learning environment have positive effects on SDL readiness, and these relationships are mediated by students’ adoption of deep learning strategies.

The finding that a deep learning approach has a mediating effect provides a conceptual understanding of how students’ SDL readiness may develop. In the context of the present study, it is clear that students’ mastery goal of learning and positive perceptions of the learning environment directly affect their development of SDL readiness. The mediating effect of the deep learning approach suggests that the development of SDL readiness may also depend on the frequent adoption of deep learning strategies. In other words, students may not be clear about the concepts and skills of SDL, however, encouraging students to frequently engage in deep processing of learning content may enhance their sense of relevance and ownership of learning tasks, and ultimately improve their abilities to manage the demands of learning and become self-directed learners.
7.4 Implications

The aim of the present study is to contribute to understanding of the development of nursing students’ SDL readiness. In the following sections, the theoretical and practical implications of the study’s results are explored.

7.4.1 Theoretical implications

The current investigation of factors influencing students’ SDL readiness was prompted by the observation that a lack of understanding exists between the implementation of learning activities encouraging students’ self-direction in learning and students’ perceptions of factors influencing outcomes of these activities in Taiwan’s undergraduate nursing programs. This gap formed the key question of this study: what are the factors influencing nursing students’ SDL readiness?

A conceptual framework based on Biggs’s (2003) ‘3P model of teaching and learning’ was established for this study. This framework proposed that nursing students’ SDL readiness as an outcome of learning (product factor) which may be influenced by their achievement goals, perceptions of the learning environment (presage factors), and approaches to learning (process factors). This theoretical approach to understanding the development of SDL readiness is new within studies of SDL, as earlier research on SDL has normally been limited to reporting on the relationship between students’ SDL readiness and their demographic characteristics or the effectiveness of specific learning programs.

Previous studies using the 3P model as a research framework have examined a range of presage factors, such as students’ academic ability, self-concept,
and perceptions of the learning environment (Drew & Watkins, 1998; Hall et al., 1995; Lizzio et al., 2002; Zhang, 2000). The present study used students’ achievement motivation as one of the presage factors in its research framework. Findings suggest that students’ achievement goal orientations are significant factors influencing the adoption of learning approaches and SDL readiness. Specifically, students with higher mastery goal orientation are more likely to adopt deep learning strategies, while students with higher alienation goal orientation are more likely to adopt surface learning strategies. Such findings provide support to Biggs’s (2003) proposition in his 3P model that students’ motivation is significant to their learning process and outcome.

In the 3P model, Biggs (2003) suggested a mediating effect of the process factor. That is, the process factor has dual influences on the product factor, in which process factors directly influence on the product factor, as well as deliver an indirect influence from presage factors to product factors. Among the reviewed studies using the 3P framework, only one study has examined the mediating effect of learning approaches (Lizzio et al., 2002). Results of Lizzio et al.’s (2003) study suggested that a deep approach to learning mediates between the presage and product factors examined in their study, however, a surface approach did not display such effect. The present study also supports this finding, indicating a deep approach has a mediating role between students’ achievement goals, perceptions of the learning environment and their SDL readiness. These empirical findings may suggest that a deep approach is more likely to mediate students’ learning outcomes.

The present study has adopted variables different from previous studies into
the 3P model to form its conceptual framework, including students’ achievement motivation and SDL readiness. Findings from the present study support that the 3P model is an appropriate framework in illustrating the interaction of a range of factors influencing student learning, if researchers carefully select factors that are theoretically justified. In addition, the 3P model have been used to explain student learning using samples of Australian, U.S., Chinese and Hong Kong students. The present study was undertaken with a sample of Taiwanese nursing students which may suggest the applicability of this model to Taiwanese samples.

Overall, findings from the present study provide support for Biggs’s 3P model as a useful framework to explain student learning. It is recommended that educational researchers who are interested in understanding factors influencing student learning outcomes consider the 3P model as a framework to guide their research.

7.4.2 Practical implications

Results from this study confirm that students’ intention to master knowledge is one of the strongest factors influencing their SDL readiness. This finding may help nurse educators and students to appreciate the significance of intrinsic motivation in learning. Nurse educators and students may be encouraged by this finding that it is the strength of interest and sense of relevance in learning that stimulates the learner towards better self-direction.

These findings further suggest that nurse educators should focus more on strategies encouraging students’ intrinsic motivation. Firstly, instead of
using extrinsic rewards alone, such as academic results, as an incentive or a threat, nurse educators could concentrate on developing curricula and learning content that are consistent with students’ interests (Frymier & Shulman, 1995). This result presents challenges for areas of nursing knowledge which students may have less interest and suggests educators need to focus efforts on stimulating interest and promoting students’ appreciation of the significance of areas which may not be of immediate interest yet essential to quality and safe practice. As the literature and interview results suggested, a positive teacher-student relationship can reinforce students’ motivation to learn (Hodgson, 1997; Lizzio et al., 2002; Regan, 2003). As such, during the process of learning, the nurse educators’ role in providing learning support, and reinforcing students’ learning effort need to be acknowledged.

For students who are orientated towards performance, the use of social or instrumental rewards by nurse educators, such as praising in front of peers or giving rewards for good performances, may be useful to encourage their initial involvement in the learning task (Ironsmith et al., 2003; Wolters, 2004). Supportive strategies, such as providing positive feedback, may be needed to further enhance their interest in learning tasks (Archer & Schevak, 1998). When, for a variety of reasons, students do not develop interest in nursing or in learning tasks, nurse educators can help students understand how their motivation may have lowered their own achievement (Wolters, 2004). This type of insight may help students either advance in their learning development or acknowledge their responsibility for maintaining their level of achievement (Archer & Schevak, 1998; Wolters, 2004).
In regard to the learning environment, interview findings provide three key areas, including teacher-student interaction, facilitation process and learning resources, which students perceived to be relevant to satisfactory outcomes of the learning activities introduced by their teachers. These domains provide a useful basis to inform the overall design and implementation of learning activities aimed at promoting SDL for undergraduate nursing students. As suggested previously, a positive teacher-student interaction may help reinforce students’ motivation to learn. It can be further suggested from the finding that equipping a learning environment with adequate learning resources and teachers using appropriate facilitation strategies are likely to make significant contributions to students’ development of learning skills for SDL and to satisfactory learning outcomes.

Results from the questionnaire survey further confirm that the key elements of the learning environment, measured by the CEQ scales, can positively influence both the way students approach their learning and the development of SDL readiness. The six domains of the learning environment measured in this study provide a guide for reflection and intervention. It appears that the provision of clear learning goals and standards and an emphasis on independence have the most significant direct and indirect influences on SDL readiness among the six domains. This result confirms that students expected that when using SDL activities to promote self-direction in learning, the nature of freedom with boundaries should be considered (Iwasiw, 1987; Livingston & Lynch, 2000; Nolan & Nolan, 1997a, 1997b; Orsmond et al., 2004). These findings therefore suggest that giving students clear directions for learning tasks and facilitating students to make independent choices can be important initial interventions if nurse
educators are seeking to improve students’ SDL readiness by introducing student-directed learning activities.

The strategy of giving students clear directions for learning tasks implies that nurse educators should clearly define learning objectives and task boundaries, and design informative evaluation tools, with which students can set their learning goals, plan the progress towards learning goals, and evaluate their own performance. These strategies may assist students to make implicit perceptions about these learning activities and learning goals become explicit, and subsequently, enable students to manage these learning activities more effectively, and develop the ability and skills of directing their own learning.

The strategy of facilitating students to make independent choices may suggest that nurse educators should give students opportunities to decide what they want to pursue in these learning activities and how they can achieve it, while ensuring that the broad scope and expected outcomes of the learning activity are made clear. Students can then be encouraged to exercise independent choices within the boundary of academic requirements. Nurse educators may have to observe students’ progress and abilities, respond to their questions and inquiries by giving timely and constructive suggestions, and continue to motivate them to become more independent and self-directed in learning.

In summary, based on the survey results, the present study suggests that educators undertake strategies of encouraging intrinsic motivation, giving clear directions for learning tasks and facilitating students to make
independent choices as initial interventions to promote SDL readiness. These interventions may have subsequent influences on the other factors as well. The positive correlation between students’ mastery goal orientation and each one of the environmental factors (except for the Appropriate Assessment) implies that the enhancement of students’ motivation to learn may change students’ perceptions of the learning environment, and vice versa. The positive correlation among the six domains of the learning environment also implies that change in one domain may influence the other domains. For example, setting clear learning goals for students and encouraging independent choices may offer a greater opportunity for students to improve their workload management and to reduce reliance on teachers’ instructions; at the same time, it may change students’ perceptions of teaching, workload and assessment procedures (Diseth et al., 2006; Lizzio et al., 2002; Richardson, 2005). The overall change of perceptions of the learning environment may further contribute to the development of student SDL readiness.

7.5 Limitations and Recommendations to Future Research

Findings of this study support the conceptual framework for this study, in that the presage factors (students’ mastery goal orientation and their perceptions of the learning environment) and a process factor (deep approaches to learning) strongly influence the product factor (SDL readiness), with the process factor exercising a mediating effect between presage and product factors. While the linear presentation of this model is considered valid, the results can not demonstrate the reciprocal and interactive relationships between these factors which have been suggested in Biggs’s (2003) ‘3P model of teaching and learning’.
The present study did not examine the complex interaction between students’ motivation and perceptions of the learning environment which maintained as separate and independent theoretical constructs in this study’s conceptual framework. It has been suggested that these factors may influence each other over time. For example, Wolters’ (2004) study found that students who perceived their learning environment to be more mastery structured are more likely to report a higher mastery goal orientation, and students who viewed their classroom’s instructional practices as stressing performance goals are more likely to adopt performance goals for themselves. On the other hand, students’ goal orientations may influence the way they approach teachers and the learning environment. Karabenick’s (2003) study suggested that students who adopt higher mastery goal orientation are more likely to engage in instrumental/autonomous help seeking strategies (by asking for explanation of deeper meanings), whereas those who adopt higher performance goal orientation either avoid seeking help or seek expedient help (by asking for direct answers to problems). The differences in students’ motivation may affect their interactions with teachers and the environment, which in turn may influence their perceptions of the learning environment as being supportive or inhibitive.

The 3P model also suggests that students’ experiences with their learning outcomes might change their perceptions of the learning environment or personal interest in the learning subject, which in turn may affect their approaches to learning and subsequent outcomes (Biggs, 2003). In this study’s conceptual framework, presumably, when students develop better SDL readiness, the skills and attributes of being self-directed may help them
become more involved in learning and be more capable of managing learning tasks. The exercise of self-direction in learning may reciprocally affect how they perceive their learning tasks, and subsequently influence the adoption of learning strategies. This assumption may be supported by the interview findings from the present study which suggest that some participants believed that satisfactory learning experiences and outcomes and better self-management skills encourage them to have greater interest in learning. These findings are in line with Ramsden’s (2003) report of his interview evidence that a deep approach and course satisfaction demonstrate a reciprocal relationship. However, to address the interactive and reciprocal relationships between factors in the conceptual framework, future research should employ longitudinal study methods and more complex analysis procedures to examine the interactive nature of factors in this learning model.

Results of the survey indicate that students’ achievement goals and their perceptions of the learning environment explained a considerable proportion (25%) of the variance of students’ SDL readiness. However, this result may also imply that there are other factors that may be significant to the development of students’ SDL readiness. For example, participants in the interviews conducted for this study frequently mentioned their experiences of team work may have influenced their development of learning skills. Some researchers have suggested that the interaction within members of a study group significantly influence group productivity and students’ learning outcomes (Livingston & Lynch, 2000; Lizzio & Wilson, 2005; Orsmond et al., 2004). Future research should explore a broader range of issues related to students’ leaning experiences and investigate their effects on the
development of SDL readiness.

Another limitation of the present study is the small number of male students in both the qualitative and quantitative studies. Although the proportion of gender distribution in this sample represents the female-dominated nature of the nursing profession in Taiwan, future research should seek to establish if the identified factors and their relationships are generalisable across genders using a larger sample of male nursing students.

One comment should also be made regarding the level of generalisability of the present study. The relationship between students’ achievement motivation, perceptions of the learning environment, and SDL readiness as modelled in this study may not be as coherent and consistent for all groups of nursing students. The sampling strategies employed in this study (voluntary participation) may not access the atypical students who are most likely to display learning styles which are outside these conceptual boundaries. Future research should seek sampling strategies which encourage the responses from a broad range of students.

Finally, all data regarding the students’ motivational and environmental factors, learning approaches and SDL readiness are in the form of student self-report. This raises issues of common method variances influencing the direction of results. The factors which are good predictors of SDL readiness in this study may not necessarily predict other kinds of learning outcomes such as academic success. For example, within the interpretations of achievement goal and its relationships with students’ adoption of learning approaches and SDL readiness, students who are overly concerned with
appearing competent may be more likely to overstate their use of positive learning strategies and styles on this self-report type of measure. Future research should seek to confirm and extend the present findings regarding the relationships between presage and process to product factors by measuring additional aspects of learning outcomes, such as students’ overall academic performance or other external assessment of the learning outcomes.

7.6 Conclusion

This study advances the understanding of SDL by addressing gaps in research and by exploring students’ perceptions of factors influencing their self-direction in learning. Students’ experiences with learning activities introduced to encourage SDL in their undergraduate programs were explored in the stage one study. Findings from this stage provide insight into students’ experiences with these learning activities, which suggest that students need appropriate facilitation and support from the teacher and the learning environment during the process of these SDL activities. These findings contribute to our understanding of students’ needs, and provide guidance for nurse educators in assisting students towards better self-direction in learning.

This study advances knowledge of nursing education by examining the relationships between students’ motivational, environmental factors and their SDL readiness, which have not been tested in previous studies. The survey (stage two) study elaborates on earlier research of student learning and extends the findings from the stage one study, revealing that students’ mastery goal orientation, their positive perceptions of the learning
environment and adoption of deep approaches to learning are important to their development of SDL readiness. Such findings provide support for the use of theories of student approaches to learning as a conceptual framework to understand and explain the development of students’ SDL readiness.

Finally, this study has several implications for practice and for future research. Based on the interview results, this study recommends three key areas (teacher-student interaction, facilitation process and learning resources) that nurse educators can focus attention to enable a supportive learning environment for students that may be conducive to the development of SDL readiness. The survey results provide some suggestions for interventions that nurse educators may implement to enhance students’ SDL readiness: encouraging students’ intrinsic motivation, giving clear directions for learning tasks, and facilitating students to make independent choices. This study also provides recommendations for future research. It is envisaged that these recommendations may help future researchers focus their research design and further understandings of how to help students develop their ability to become self-directed learners. Given the rapidly changing and complex health care environment which exists today, such qualities are likely to be essential characteristics of safe and competent health care practitioners if they are to meet the demands of the current and future health care environment.
References


References


References

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References


Kember, D. (2000). Misconceptions about the learning approaches,
motivation and study practices of Asian students. *Higher Education, 40*(1), 99-121.


References


References

69-77.


Williams, B. (2002). *The self-directed learning readiness of baccalaureate


Appendices

Appendix 4.1: Ethic approval from QUT and nursing departments in Taiwan

Dear Mei-hui

I write further to the application for ethical clearance for your project, "Factors influencing self-directed learning readiness amongst Taiwanese nursing students" (QUT Ref No 4297H).

On behalf of the Chair, University Human Research Ethics Committee (UHREC), I wish to confirm that the project qualifies for Level 1 (Low Risk) ethical clearance. Consequently, you are authorised to immediately commence your project on this basis.

The decision is subject to ratification at the 29 November 2005 meeting of UHREC. I will only contact you again in relation to this matter if the Committee raises any additional questions or concerns in regard to the clearance.

The University requires its researchers to comply with:
the University research ethics arrangements and the QUT Code of Conduct for Research; the standard conditions of ethical clearance; any additional conditions prescribed by the UHREC; any relevant State / Territory or Commonwealth legislation; the policies and guidelines issued by the NHMRC and AVCC (including the National Statement on Ethical Conduct in Research Involving Humans).

Please do not hesitate to contact me further if you have any queries regarding this matter.

Regards

Wendy
研究同意函
Research Consent Form

大仁科技大学 護理系 同意
澳洲昆士蘭科技大学護理博士研究生黃美惠於本系進行「護理系學生自我導向學習之影響因素」研究之學生問卷調查。

Tajen University, Department of Nursing grants permission to Mei-hui Huang, a PhD student at Queensland University of Technology, to conduct a questionnaire survey for a research project "The factors influencing the use of self-directed learning approaches by Taiwanese nursing students" with students of this school.

大仁科技大學 護理系
Department of Nursing
Tajen University
Human Research Ethics Approval Certificate

Research project, "The factors influencing the use of self-directed learning approaches by Taiwanese nursing students", conducted by Mei-Hui Huang, a PhD student of the School of Nursing at Queensland University of Technology in Australia, has been approved by the Research Ethics Committee on September 12, 2005.

Research Ethics Committee
Nursing Department
Chung-Hwa College of Medical Technology
12 September, 2005
研究同意函
Research Consent Form

美和技術學院護理系 同意
澳洲昆士蘭科技大學護理博士研究生黃美惠於本系進行「護理系學生自我導向學習之影響因素」研究之學生問卷調查。

Meiho Institute of Technology, Department of Nursing grants permission to Mei-hui Huang, a PhD student at Queensland University of Technology, to conduct a questionnaire survey for a research project “The factors influencing the use of self-directed learning approaches by Taiwanese nursing students” with students of this school.

美和技術學院 護理系
Department of Nursing
Meiho Institute of Technology

91. 9. 21
Appendices

Appendix 4.2: Interview information sheet and consent form

Queensland University of Technology

Information Sheet

Dear student,

I am writing to invite you to participate in research being undertaken as part of my PhD studies. I am carrying out research into students’ perceptions of learning. I wish to gain insights into students’ learning experiences that can be used by nurse educators to better assist students in the future.

Project title:
Factors influencing self-directed learning readiness amongst Taiwanese nursing students

Participant information statement:
This research you have been asked to participate is a part of my PhD study at Queensland University of Technology (QUT) in Australia. It will be conducted by me under the guidance of my QUT supervisor Professor Patsy Yates.

Study aims:
The aim of this study is to investigate nursing students’ learning experiences in higher education institutes. It is expected that results from this study will help nurse educators to understand the factors that influence students’ self-directed learning, develop methods to assist students’ learning journey and further improve their ability to be life-long learners.

Participant involvement:
You will be asked to participate in an in-depth interview about your motivations to study nursing and experiences of learning activities. The
interview will be conducted by me and should take between 45 minutes to one hour. Text of the interview will be audio-taped and then transcribed.

**Confidentiality:**
All information collected from the interview will be used for research purposes only and will remain in the strictest confidence. The audiotape and transcript will be locked safely and can only be accessed by me. Your name and personal information will never be mentioned or identified in any report of the research.

**Your participation:**
Your participation in this study is entirely voluntary. You may choose to refuse to participate, or to withdraw from the study at any time. Your decision will not affect your academic progress or relationship with your college.

Please read the enclosed “informed consent” form and, if you are happy to help me with my study, sign it and return it to me.

At any time if you concerned or have questions regarding your participation in the study, you may contact me or my supervisors. Our contact details are listed below. If there are matters you wish to bring to the attention of the Ethics Committee, you may contact the QUT Research Ethics Officer on 002-61-7-3864 2340 or email ethicscontact@qut.edu.au.

Yours sincerely,

_____________
Mei-hui Huang

Chief Investigator: Mei-hui Huang  
Email: mh.huang@student.qut.edu.au  
Tel: 002-67-7-3864 3882  
Address: Victoria Park Road, Kelvin Grove 4059, Queensland

Principal Supervisor: Professor Patsy Yates  
Tel: 002-61-7-3864 3835
Queensland University of Technology

Informed Consent

Research Title: Factors influencing self-directed learning readiness amongst Taiwanese nursing students

I __________________ (please print your name) have received a copy of the information sheet and have read the information regarding this study. I am willing to participate in this study.

I understand the interview will take between 45 minutes and one hour and will be audio-taped. I also understand the text of interview will be transcribed for research purposes.

I realise my personal details will be kept confidential. I also understand I can withdraw from this study at any time without penalty.

If I have any questions, I will be able to contact the investigator, Ms. Mei-hui Huang, or her supervisor.

I would like to receive a summary of the findings of the study. (please tick)

☐ YES  ☐ NO

Signature of participant: _____________ Date: _____________
Contact phone number: _____________
Email: ____________________________ or
Address: ____________________________
Appendix 4.3: Conference acceptance letter and abstract

Dear Ms Huang,

We have the pleasure to confirm the session schedule for your abstract entitled:

Self-directed learning activities in undergraduate nursing program: Students' perceptions of process and outcomes

Your submitted abstract will be published on a CD-ROM, which will be distributed at the conference.

FINAL presentation details:
Session type: Concurrent session
Presentation number: C.775.D

Session name: C.775 Nursing Education
Date: 01/06/2007
Session start time: 13:00
Session end time: 14:20
Room: 313/314

Your presentation start time: 14:00

Please note that this is the confirmed session schedule. Changes have been made to the preliminary programme and we therefore ask you to disregard previous presentation details. Moreover, there may be last minute adjustments to the programme. You are advised to check the conference...
website on a regular basis and information on-site in Yokohama.

The guidelines for concurrent sessions can be found attached to this e-mail or on the website www.icn.ch. Please note that you have 18-20 minutes for your presentation including time for discussion. We strongly urge you to allow time for questions and comments. Three abstracts will be presented in each concurrent session of 50 minutes. Four abstracts will be presented in each concurrent session of 80 minutes. Ten minutes are allocated between sessions to allow participants to change rooms without disrupting the presenters.

We hope to have informed you sufficiently. Should any questions remain, please do not hesitate to contact us. We look forward to meeting you in Yokohama!

If your plans have changed and you will not be attending the conference, please let us know so that alternative presenters may be contacted.

With kind regards, on behalf of the Scientific Programme Committee,
CONGREX HOLLAND BV

ICN 2007 Abstract Team
Phone: +31 20 5040 203
Fax: +31 20 5040 225
E-mail: icn2007abstracts@congrex.nl
Powered by Shocklogic (www.shocklogic.com)
Abstract of proposed conference paper

Self-directed learning activities in undergraduate nursing program: students’ perceptions of process and outcomes

Mei-hui Huang MN; Patsy Yates, PhD; Robyn Nash, MHlthSc

Background: Self-directed learning activities are increasingly used in nursing undergraduate programs in order to improve students’ life-long learning skills. In Taiwan, research into the issue of self-directed learning activities is limited. There is a need for in-depth exploration of students’ experiences with these activities.

Aims: This study aims to explore students’ perceptions of self-directed learning processes and the perceived outcomes for their learning.

Methods and sample: A qualitative approach (semi-structured interview) was used in this study. Nursing students in the final year of undergraduate programs in Taiwan were invited to participate; eight participants responded to the invitation and completed the interviews.

Results: Analysis identified that individual and group reports were the most commonly used self-directed learning activities in the undergraduate nursing programs in Taiwan. During the process of these activities, students expected teachers to demonstrate commitment to teaching and to provide technical support, such as giving clear goals and locating learning resources, when needed. Participants suggested the activities resulted in an improvement of their learning abilities in terms of time management, skills in information searching and integration, as well as communication skills.

Conclusions: Undergraduate nursing students clearly described their expectations of teaching support within the context of self-directed learning activities. They further perceived that the experiences of these activities had contributed to improvements in their learning. With appropriate assistance, students’ learning may be improved through the use of self-directed learning activities.
Appendix 4.4: Permissions to use questionnaires

Of course. no need to ask. Just give due acknowledgement.

John Biggs
PO Box 1083
SANDY BAY,
Tas 7006
As John has said to are welcome to use it. We do have a Chinese translation. I believe the characters may be a bit different in Taiwan, but my colleague Doris will send you a copy anyway.

David

David Kember
Professor of Learning Enhancement
Centre for Learning Enhancement and Research (CLEAR)
Rm 302 Academic Building No 1
Chinese University of Hong Kong
Shatin
Hong Kong

Tel no: 2609 6034
Fax no: 2603 6804

david.kember@cuhk.edu.hk
Dear Bonnie

We would be more than happy for you to use our scale for your research. I have attached a copy of the request form and the instrument. Note that we have reversed the scoring on four items (I think), this will be clear on the marking criteria. The approval is conditional to the completion of the request form. All you need to do is send the form back to us completed but you have our approval in the interim.

We ask that you add the reference to the nurse education today article. We request a copy of any publications arising from the use of the instrument. We also maintain copy right of any interpretation of the scale.

Thanks
Murray
Dear Bonnie

Thank you for your e-mail and please accept my apologies for the delayed response.

Professor Paul Ramsden has granted you permission to adopt items from the CEQ.

Good luck with the rest of your research.

Kind regards
Annita
Annita Hirons
PA to Professor Paul Ramsden - Chief Executive and Professor Leslie Wagner - Chair

Direct Line: +44 (0)1904 717521
Reception: +44 (0)1904 717500
Fax: +44 (0)1904 717505

The Higher Education Academy
Innovation Way
York Science Park
Heslington
York YO10 5BR
United Kingdom
Dear Bonnie,

If you give me your address I can send a copy of the original questionnaire to you. I'm looking forward to hearing how your research progresses.

regards,

Jenny Archer

Dr Jennifer Archer  
Dean of Students  
Level 3, Student Services Centre  
Phone: (02) 49215806  
resolutionprecinct@newcastle.edu.au

Senior Lecturer  
School of Education, Faculty of Education and Arts  
Chair, Teacher Education Committee  
University of Newcastle, Callaghan, NSW, Australia  
Phone: (02) 49216723; Fax 49217916  
Jennifer.Archer@newcastle.edu.au  
### Appendix 4.5: Comparison of translated and back translated instruments

#### Mastery, Performance and Alienation Goal Scales

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<thead>
<tr>
<th>Translated version</th>
<th>Back-translated version</th>
<th>Original version</th>
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<tbody>
<tr>
<td>下列的情況，何時會讓你覺得很有成就感…</td>
<td>With the following situations, when do you feel a sense of achievement…</td>
<td>When did you feel most successful…</td>
</tr>
<tr>
<td>1. 當上課的內容引發你的思考時。</td>
<td>1. When class topics inspire you to think.</td>
<td>1. When a lecture or tutorial made you think about things</td>
</tr>
<tr>
<td>2. 當你什麼也沒做，卻能僥倖通過時。</td>
<td>2. When you did nothing and passed through by sheer luck.</td>
<td>2. When you did almost no work and got away with it</td>
</tr>
<tr>
<td>3. 當你得到的分數比其他同學更高時。</td>
<td>3. When you receive higher grades than your classmates.</td>
<td>3. When you got a higher mark than other students</td>
</tr>
<tr>
<td>4. 當你學到一些有趣的東西時。</td>
<td>4. When you learn something interesting.</td>
<td>4. When you learned something interesting</td>
</tr>
<tr>
<td>5. 當你在別人面前表現出自己的聰明才智時。</td>
<td>5. When you show your intelligence in front of others.</td>
<td>5. When you showed people that you were smart</td>
</tr>
<tr>
<td>6. 當你學到了一些東西，進而想要學更多時。</td>
<td>6. When you learned something that makes you want to learn more.</td>
<td>6. When something you learned make you want to find out more</td>
</tr>
<tr>
<td>7. 當你不必太努力用功時。</td>
<td>7. When you do not have to study hard.</td>
<td>7. When you didn’t have to work too hard</td>
</tr>
<tr>
<td>8. 當你是唯一能回答老師所提出的問題的人時。</td>
<td>8. When you are the only one to answer the teacher’s question.</td>
<td>8. When you were the only one who could answer the lecturer’s questions</td>
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<tr>
<td>你對下列情況的滿意程度是…</td>
<td>With the following situations, what is your degree of satisfaction….</td>
<td>How satisfied did you feel when you…</td>
</tr>
<tr>
<td>1. 學到新的事物時。</td>
<td>1. When you learn new things.</td>
<td>1. Learned something new</td>
</tr>
<tr>
<td>2. 在班上比其他同學表現得更好。</td>
<td>2. When your performance is better than others in the class.</td>
<td>2. Did better than the other students in the class</td>
</tr>
<tr>
<td>3. 當你知道不必太用功，就能通過這個課程。</td>
<td>3. When you realize you did not study hard but nevertheless pass the course.</td>
<td>3. Realised you were getting through the course without having to work hard</td>
</tr>
<tr>
<td>4. 讀到一些有趣的東西。</td>
<td>4. When you study something interesting.</td>
<td>4. Read something interesting</td>
</tr>
<tr>
<td>5. 當你了解到不必為上課預先做準備。</td>
<td>5. When you realize you do not have to prepare before class.</td>
<td>5. Realised you didn’t have to prepare for tutorials</td>
</tr>
<tr>
<td>6. 做具有挑戰性的任務或作業。</td>
<td>6. When doing a challenging task or assignment.</td>
<td>6. Worked on a challenging task or assignment</td>
</tr>
<tr>
<td>你對下列敘述的同意程度是:</td>
<td>How much do you agree with these statements…</td>
<td>How much do you agree with these statements…</td>
</tr>
<tr>
<td>1. 我喜歡成為所屬團體中表現最好的人。</td>
<td>1. I like to be the best performer in the group</td>
<td>1. I like to be to top person in my group</td>
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</tr>
<tr>
<td>下列何時你會對自己充滿信心…</td>
<td>When did you feel positive about yourself…</td>
<td>When did you feel greatly satisfied or positive about yourself…</td>
</tr>
<tr>
<td>1. 完成別人所不會做的事情。</td>
<td>1. When you complete something which others cannot complete.</td>
<td>1. Accomplished something that others couldn’t do</td>
</tr>
<tr>
<td>2. 第一次接觸就能理解(所學的事物)。</td>
<td>2. When understand something at the first time.</td>
<td>2. Understood something from the first time</td>
</tr>
<tr>
<td>3. 完全投入所從事的事情。</td>
<td>3. When you are completely devoted into something.</td>
<td>3. Were involved totally in something that you were doing</td>
</tr>
<tr>
<td>4. 獲得團體的認同或好名聲。</td>
<td>4. When you earn the group’s approval or a good reputation.</td>
<td>4. Received recognition or prestige</td>
</tr>
<tr>
<td>5. 提升了自己在團體中的地位。</td>
<td>5. When you improve your standing in the group</td>
<td>5. Enhance you status in the group</td>
</tr>
</tbody>
</table>
### Revised Study Process Questionnaire 2-Factors (R-SPQ-2F)

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<th>Translated version</th>
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<tbody>
<tr>
<td>1. 我發現有時候讀書能給我強烈的滿足感。</td>
<td>1. I notice that sometimes studying provides me with a strong sense of satisfaction.</td>
<td>1. I find that at times studying gives me a feeling of deep personal satisfaction.</td>
</tr>
<tr>
<td>2. 發現我會對一個課題投注足夠的心力，直到得到我自己的結論，才會滿意。</td>
<td>2. I will concentrate fully on a study topic and be satisfied once I arrive at my conclusion.</td>
<td>2. I find that I have to do enough work on a topic so that I can form my own conclusions before I am satisfied.</td>
</tr>
<tr>
<td>3. 我以花最少的努力而能考試及格為目標。</td>
<td>3. It is my goal to pass every subject with the least amount of effort.</td>
<td>3. My aim is to pass the course while doing as little work as possible.</td>
</tr>
<tr>
<td>4. 我只會認真溫習上課時分發的課程大綱和講義。</td>
<td>4. I will only concentrate my review on the outlines and handouts given out during classes.</td>
<td>4. I only study seriously what’s given out in class or in the course outlines.</td>
</tr>
<tr>
<td>5. 我認為只要投入，幾乎所有的課題都可以是很有興趣的。</td>
<td>5. As long as I focus, all study topics can be interesting.</td>
<td>5. I feel that virtually any topic can be highly interesting once I get into it.</td>
</tr>
<tr>
<td>6. 我覺得大部分的新課程都很有趣，也經常利用課餘時間尋找更多有關的資訊。</td>
<td>6. I find most study topics to be interesting and will make use of after-class time to find related information.</td>
<td>6. I find most new topics interesting and often spend extra time trying to obtain more information about them.</td>
</tr>
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</tr>
<tr>
<td>7. 我對所讀的課程不感興趣，因此我只將最少的心力放在功課上。</td>
<td>7. I am not interested in my current study topics and will use minimum effort on my homework.</td>
<td>7. I do not find my course very interesting so I keep my work to the minimum.</td>
</tr>
<tr>
<td>8. 即使不了解課程的內容，我也會一遍一遍的背誦，直至熟記為止。</td>
<td>8. Even if I don’t understand the topic content, I will study until I have memorized the material.</td>
<td>8. I learn some things by rote, going over and over them until I know them by heart even if I do not understand them.</td>
</tr>
<tr>
<td>9. 我發現在學一些學術性的課題時，有時候會像讀到一本好小說或看一齣好電影一樣，令人雀躍。</td>
<td>9. While studying an academic topic, sometimes it feels like reading a novel or watching a good movie. This makes me jump for joy.</td>
<td>9. I find that studying academic topics can at times be as exciting as a good novel or movie.</td>
</tr>
<tr>
<td>10. 我會測試自己對重要課題的了解，直到確定自己完全明白為止。</td>
<td>10. I will test myself on the understanding of important topics until I fully understand it.</td>
<td>10. I test myself on important topics until I understand them completely.</td>
</tr>
<tr>
<td>11. 我發現我只要背熟課程中一些重要的段落，就能通過大部分的測驗和考試，並不需要完全明白課程內容。</td>
<td>11. Once I memorize important parts of a topic, I can pass most tests. There is no need to completely understand the topic.</td>
<td>11. I find I can get by in most assessments by memorising key sections rather than trying to understand them.</td>
</tr>
<tr>
<td>12. 我通常只溫習老師指定的範圍，因為覺得沒有必要再下額外的功夫。</td>
<td>12. I only review outlines provided by the teacher and feel there is no need to put forth additional effort.</td>
<td>12. I generally restrict my study to what is specifically set as I think it is unnecessary to do anything extra.</td>
</tr>
<tr>
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</tr>
<tr>
<td>13. 我很用功讀書，因為我覺得課程內容相當有趣。</td>
<td>13. I study hard because I find the topic is interesting.</td>
<td>13. I work hard at my studies because I find the material interesting.</td>
</tr>
<tr>
<td>14. 對於在不同的課堂上討論過的有趣課題，我花很多我自己的時間去做進一步了解。</td>
<td>14. For interesting topics discussed in different classes, I will spend time outside of class to understand it.</td>
<td>14. I spend a lot of my free time finding out more about interesting topics which have been discussed in different classes.</td>
</tr>
<tr>
<td>15. 我發現深入研究一些課題並沒有幫助，只會讓人更混淆，並且浪費時間。我只需要對課題略有認識就可以了。</td>
<td>15. Studying a topic thoroughly is not helpful; instead it causes confusion and is a waste of time. Especially when all you require is a minimum understanding.</td>
<td>15. I find it is not helpful to study topics in depth. It confuses and wastes time, when all you need is a passing acquaintance with topics.</td>
</tr>
<tr>
<td>16. 我認為老師不應該要求學生花太多時間學習那些每個人都知道不會考的內容。</td>
<td>16. I think teachers should not ask students to spend time studying topics which everyone knows will not be tested.</td>
<td>16. I believe that lecturers shouldn’t expect students to spend significant accounts of time studying material everyone knows won’t be examined.</td>
</tr>
<tr>
<td>17. 大部分我在上課前都有準備一些問題，等上課時找到答案。</td>
<td>17. Most of the time, I will think of questions before class and find the answers to these questions during class.</td>
<td>17. I come to most classes with questions in mind that I want answering.</td>
</tr>
<tr>
<td>18. 我覺得讀完課堂上老師所建議的參考資料是很重要的。</td>
<td>18. Studying reference materials suggested by the teacher is very important.</td>
<td>18. I make a point of looking at most of the suggested readings that go with the lectures.</td>
</tr>
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<td>Translated version</td>
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</tr>
<tr>
<td>19. 我覺得沒有必要學習那些考試不太可能會出現的內容。</td>
<td>19. There is no need to study topics which might not possibly be tested.</td>
<td>19. I see no point in learning material which is not likely to be in the examination.</td>
</tr>
<tr>
<td>20. 我覺得要考試及格，最好的方法就是牢記可能會出現的題目和答案。</td>
<td>20. To pass a test, the best method is to memorize all the possible questions and answers.</td>
<td>20. I find the best way to pass examinations is to try to remember answers to likely questions.</td>
</tr>
</tbody>
</table>
### Course Experience Questionnaire (CEQ)

<table>
<thead>
<tr>
<th>Translated version</th>
<th>Back-translated version</th>
<th>Original version</th>
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</thead>
<tbody>
<tr>
<td><strong>Clear goal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 在這裡讀書很容易知道我們被期望的課業標準在哪裡。</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. 大多數的時候我都能清楚地明瞭自己的方向和別人對我的期望。</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. 在這些課程中，通常很難發現別人對我的期望是什麼。</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. 這些課程的目的和目標並不是很清楚。</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. 這裡的任課老師，一開始就清楚地說明他們對學生的期望是什麼。</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Students who study here can easily understand the school’s expected standards regarding our schoolwork.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Most of the time, you (I) clearly understand your (my) own direction and others’ expectation of me.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. In these courses, it is difficult to know others’ expectation of you (me).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The aim and goal of these courses are not clear.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. From the start, teachers clearly make known their expectations of the students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. It’s always easy here to know the standard of work expected.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. You usually have a clear idea of where you’re going and what’s expected of you.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. It’s often hard to discover what’s expected of you in this course</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. The aims and objectives of this course are not made very clear</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. The staff here make it clear right from the start what they expect from students</td>
<td></td>
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<td>Translated version</td>
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</tr>
<tr>
<td><strong>Independence</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. 這裡很少有機會可以選擇自己特定想學習的領域。</td>
<td>6. There is very little chance of selecting your (my) desired field of study here.</td>
<td>6. There are few opportunities to choose the particular areas you want to study.</td>
</tr>
<tr>
<td>7. 這些課程盡可能地鼓勵我發展自己在學術方面的興趣。</td>
<td>7. These courses encourage me to develop my learning interest as much as possible.</td>
<td>7. The course has encouraged me to develop my own academic interests as far as possible.</td>
</tr>
<tr>
<td>8. 在這些課程中，學生對於他們想要如何學習，有很大的選擇權利。</td>
<td>8. In these courses, students have the right to select what they want to learn.</td>
<td>8. Students have a great deal of choice over how they are going to learn in this course.</td>
</tr>
<tr>
<td>9. 這裡的學生對於他們所要做的作業，有很多種選擇。</td>
<td>9. Students have a lot of options in selecting their homework assignment.</td>
<td>9. Students here are given a lot of choice in the work they have to do.</td>
</tr>
<tr>
<td>10. 我們經常與老師討論要如何學習這些課程。</td>
<td>10. We often discuss how to study these courses with teachers.</td>
<td>10. We often discuss with our lecturers or tutors how we are going to learn in this course.</td>
</tr>
<tr>
<td>11. 在這些課程中，我們對於學習結果的評量方式，選擇很少。</td>
<td>11. In these courses, you (we) have limited options regarding assessment methods.</td>
<td>11. There’s very little choice in this course in the ways you are assessed.</td>
</tr>
<tr>
<td>Translated version</td>
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<tr>
<td>--------------------------------------------------------</td>
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</tr>
<tr>
<td>Good teaching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. 任課老師常鼓勵學生達到他們最好的表現。</td>
<td>12. Teachers often encourage students to achieve their best performance.</td>
<td>12. The teaching staff of this course motivates students to do their best work.</td>
</tr>
<tr>
<td>13. 這裡的老師花很多時間給學生的作業寫評語。</td>
<td>13. Teachers spend a lot of time writing comments for student assignments.</td>
<td>13. Staff here put a lot of time into commenting on students’ work</td>
</tr>
<tr>
<td>14. 任課老師都盡量地體諒學生在做作業的過程中，所可能遇到的困難。</td>
<td>14. Teachers try to understand the difficulties faced by students on their homework assignments.</td>
<td>14. The staff make a real effort to understand difficulties students may be having with their work</td>
</tr>
<tr>
<td>15. 任課老師通常會根據學生的表現給予有幫助的回饋。</td>
<td>15. Teachers usually give helpful feedback regarding each student’s performance.</td>
<td>15. Teaching staff here normally give helpful feedback on how you are going</td>
</tr>
<tr>
<td>16. 任課老師非常善於向我們解說事情。</td>
<td>16. The teacher is good at explaining things to us.</td>
<td>16. Our lecturers are extremely good at explaining things to us</td>
</tr>
<tr>
<td>17. 任課老師很努力的讓課程顯得有趣。</td>
<td>17. The teacher works hard at making the class interesting.</td>
<td>17. Teaching staff here work hard to make subjects interesting</td>
</tr>
<tr>
<td>18. 這裡的老師對於學生所要表達的事，表現出沒興趣的樣子。</td>
<td>18. The teacher shows no interest in what the students try to express.</td>
<td>18. Staff here show no real interest in what students have to say</td>
</tr>
<tr>
<td>19. 這些課程真的嘗試著讓所有的學生都能表現到最好。</td>
<td>19. These courses attempt to allow all students to perform their best.</td>
<td>19. This course really tries to get the best out of all its students</td>
</tr>
<tr>
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<td>Original version</td>
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<tr>
<td>----------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Appropriate workload</td>
<td>20. There is a heavy homework load.</td>
<td>20. This workload is too heavy.</td>
</tr>
<tr>
<td>20. 這裡的作業量太重了。</td>
<td>21. To me, the syllabus covers too many topics.</td>
<td>21. It seems to me that the syllabus tries to cover too many topics.</td>
</tr>
<tr>
<td>21. 對我而言教學大綱中涵蓋的主題太多了。</td>
<td>22. We have sufficient time to understand the things we have to learn.</td>
<td>22. We are generally given enough time to understand the things we have to learn.</td>
</tr>
<tr>
<td>22. 我們通常有足夠的時間去了解要學習的東西。</td>
<td>23. Being a student here puts a lot of pressure on me.</td>
<td>23. There’s a lot of pressure on you as a student here.</td>
</tr>
<tr>
<td>23. 當這裡學生，我感受到許多壓力。</td>
<td>24. The volume of schoolwork makes you (me) unable to thoroughly understand the things you (I) have learned.</td>
<td>24. The sheer volume of work to be got through in this course means you can’t comprehend it all thoroughly.</td>
</tr>
<tr>
<td>24. 這些課程全部的功課量，使我無法透徹地了解所學的東西。</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>Back-translated version</td>
<td>Original version</td>
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</tr>
<tr>
<td>Appropriate assessment</td>
<td>25. Teachers give the feeling that they can not learn anything from students.</td>
<td>25. Lecturers here frequently give the impression they have nothing to learn from students.</td>
</tr>
<tr>
<td>25. 這裡的老師經常給人一種他們在學生身上學不到任何東西的感覺。</td>
<td>26. A good memory is the only requirement to do well in these courses.</td>
<td>26. To do well on this course all you really need is a good memory</td>
</tr>
<tr>
<td>26. 要把這些課程學好，所需要的只是良好的記憶力而已。</td>
<td>27. The teacher is more interested in testing me on what I remember than what I understand.</td>
<td>27. Staff seem more interested in testing what you’ve memorised than what you’ve understood</td>
</tr>
<tr>
<td>27. 老師似乎比較有興趣測驗我所記得的，而不是我所了解的。</td>
<td>28. Teachers only ask us questions related to our learning contents.</td>
<td>28. Too many staff ask us questions just about facts</td>
</tr>
<tr>
<td>28. 很多老師只問我們跟學理有關的問題。</td>
<td>29. The teacher only gives the student marks or grades as the feedback for an assignment.</td>
<td>29. Feedback on student work is usually provided only in the form of marks and grades</td>
</tr>
<tr>
<td>29. 老師對學生作業的回饋，通常只有分數或等第而已。</td>
<td>30. It is possible to pass the courses by studying hard during test periods.</td>
<td>30. It would be possible to get through this course just by working hard around exam times</td>
</tr>
<tr>
<td>30. 我們只要在考試期間努力一下，就有可能通過這些課程。</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>Original version</td>
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</tr>
<tr>
<td><strong>Learning resources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. 我們有被教導如何搜尋課程所需的相關資訊。</td>
<td>31. We were taught how to find relevant information for this course.</td>
<td>31. 我們有被教導如何搜尋課程所需的相關資訊。</td>
</tr>
<tr>
<td>32. 很難找得到我們課程所需的相關資訊。</td>
<td>32. It is difficult to find the information that we need for this course.</td>
<td>32. 很難找得到我們課程所需的相關資訊。</td>
</tr>
<tr>
<td>33. 老師有教我們如何分辨與課程相關的文獻。</td>
<td>33. Our lecturers showed us how to identify relevant information.</td>
<td>33. 老師有教我們如何分辨與課程相關的文獻。</td>
</tr>
<tr>
<td>34. 當有需要時,我們知道如何可以聯絡到任課老師。</td>
<td>34. We know how to contact our teachers when we need to.</td>
<td>34. 當有需要時,我們知道如何可以聯絡到任課老師。</td>
</tr>
<tr>
<td>35. 任課老師願意花時間和同學討論作業。</td>
<td>35. Lecturers here spend enough time having discussions with students.</td>
<td>35. 任課老師願意花時間和同學討論作業。</td>
</tr>
<tr>
<td>36. 我們的圖書館和資料庫提供充足的資訊供我們查詢。</td>
<td>36. Our library and database provide enough information resources for us.</td>
<td>36. 我們的圖書館和資料庫提供充足的資訊供我們查詢。</td>
</tr>
</tbody>
</table>
### Self-directed Learning Readiness Scale (SDLRS)

<table>
<thead>
<tr>
<th>Translated version</th>
<th>Back-translated version</th>
<th>Original version</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-management (自我管理)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 我有很好的管理技巧。</td>
<td>1. I have very good management techniques.</td>
<td>1. I have good management skills.</td>
</tr>
<tr>
<td>2. 我沒有好好的管理我的時間。</td>
<td>2. I do not manage my time well.</td>
<td>2. I do not manage my time well.</td>
</tr>
<tr>
<td>3. 我會規範我自己。</td>
<td>3. I can regulate myself.</td>
<td>3. I am self disciplined.</td>
</tr>
<tr>
<td>4. 我很沒有組織性。</td>
<td>4. I have no sense of organization.</td>
<td>4. I am disorganised.</td>
</tr>
<tr>
<td>5. 我會訂定嚴格的時間表。</td>
<td>5. I set up strict timetables.</td>
<td>5. I set strict time frames.</td>
</tr>
<tr>
<td>7. 我會安排特定的時間讀書。</td>
<td>7. I arrange a specific time to study.</td>
<td>7. I set specific times for my study.</td>
</tr>
<tr>
<td>8. 我運用計畫來解決問題。</td>
<td>8. I make use of planning to solve problems.</td>
<td>8. I solve problems using a plan.</td>
</tr>
<tr>
<td>10. 我自己進行學習的能力是值得被信任的。</td>
<td>10. My ability of self-studying can be trusted.</td>
<td>10. I can be trusted to pursue my own learning.</td>
</tr>
<tr>
<td>11. 我喜歡計畫我自己的學習。</td>
<td>11. I like to plan my own studying.</td>
<td>11. I prefer to plan my own learning.</td>
</tr>
<tr>
<td>12. 我對自己搜尋資訊的能力有信心。</td>
<td>12. I have confidence in my ability to search for information.</td>
<td>12. I am confident in my ability to search out information.</td>
</tr>
<tr>
<td>Translated version</td>
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</tr>
<tr>
<td><strong>Desire for learning (學習需求)</strong></td>
<td><strong>背譯版本</strong></td>
<td><strong>原版</strong></td>
</tr>
<tr>
<td>1. 我需要知道為什麼。</td>
<td>1. I need to understand why.</td>
<td>1. I need to know why</td>
</tr>
<tr>
<td>2. 我會批判性的去評估新的觀點。</td>
<td>2. I critically analyze new viewpoints.</td>
<td>2. I critically evaluate new ideas</td>
</tr>
<tr>
<td>3. 我從自己的錯誤中學習。</td>
<td>3. I learn from my own mistakes.</td>
<td>3. I learn from my mistakes</td>
</tr>
<tr>
<td>4. 我對新的觀點持開放的態度。</td>
<td>4. I am open to new viewpoints.</td>
<td>4. I am open to new ideas</td>
</tr>
<tr>
<td>5. 當遇到我不能解決的問題時，我會尋求協助。</td>
<td>5. I seek help when I cannot solve a question.</td>
<td>5. When presented with a problem I cannot resolve, I will ask for assistance</td>
</tr>
<tr>
<td>6. 我喜歡評估我所做的事。</td>
<td>6. I like to evaluate the things I do.</td>
<td>6. I like to evaluate what I do</td>
</tr>
<tr>
<td>7. 我不享受讀書的樂趣。</td>
<td>7. I do not enjoy studying.</td>
<td>7. I do not enjoy studying</td>
</tr>
<tr>
<td>8. 我有學習的需求。</td>
<td>8. I have learning demands.</td>
<td>8. I have a need to learn</td>
</tr>
<tr>
<td>9. 我喜歡具挑戰性的活動。</td>
<td>9. I like challenging activities.</td>
<td>9. I enjoy a challenge</td>
</tr>
<tr>
<td>10. 我想要學習新的資訊。</td>
<td>10. I want to learn new information.</td>
<td>10. I want to learn new information</td>
</tr>
<tr>
<td>11. 我享受學習新資訊的樂趣。</td>
<td>11. I enjoy learning new information.</td>
<td>11. I enjoy learning new information</td>
</tr>
<tr>
<td>12. 我喜歡先收集現實情況後，再做決定</td>
<td>12. I like to assess a situation before making any decisions.</td>
<td>12. I like to gather the facts before I make a decision</td>
</tr>
<tr>
<td>Translated version</td>
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</tr>
<tr>
<td>Self-control (自我控制)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 我能集中注意力在一个问题上。</td>
<td>1. I can concentrate on one problem.</td>
<td>1. I am able to focus on a problem.</td>
</tr>
<tr>
<td>2. 我喜欢设定自己的学习目标。</td>
<td>2. I like to set my learning goals.</td>
<td>2. I prefer to set my own learning goals.</td>
</tr>
<tr>
<td>3. 我很负责。</td>
<td>3. I am responsible.</td>
<td>3. I am responsible.</td>
</tr>
<tr>
<td>4. 我有高度的自我期许。</td>
<td>4. I have high expectations of myself.</td>
<td>4. I have high personal expectations.</td>
</tr>
<tr>
<td>5. 我有高度的个人标准。</td>
<td>5. I set high goals for myself.</td>
<td>5. I have high personal standards.</td>
</tr>
<tr>
<td>6. 我高度信任我的能力。</td>
<td>6. I highly trust my own abilities.</td>
<td>6. I have high beliefs in my abilities.</td>
</tr>
<tr>
<td>7. 我知道我自己的极限。</td>
<td>7. I know my limitations.</td>
<td>7. I am aware of my own limitations.</td>
</tr>
<tr>
<td>8. 我很有逻辑。</td>
<td>8. I am logical.</td>
<td>8. I am logical.</td>
</tr>
<tr>
<td>10. 我喜欢设定自己的标准来评估我的表现。</td>
<td>10. I like to set a goal to evaluate my own performance.</td>
<td>10. I prefer to set my own criteria on which to evaluate my performance.</td>
</tr>
<tr>
<td>11. 我对自已的决定/行动负责。</td>
<td>11. I take responsibility for my own actions and decisions.</td>
<td>11. I am responsible for my own decisions/actions.</td>
</tr>
<tr>
<td>12. 我能为自己找到资讯。</td>
<td>12. I can find information by myself.</td>
<td>12. I can find out information for myself.</td>
</tr>
<tr>
<td>13. 我喜欢为自己做决定。</td>
<td>13. I like to make decisions by myself.</td>
<td>13. I like to make decisions for myself.</td>
</tr>
<tr>
<td>15. 我无法掌控我的生活。</td>
<td>15. I am unable to control my life.</td>
<td>15. I am not in control of my life.</td>
</tr>
</tbody>
</table>
Appendix 4.6: Survey questionnaire and covering letter

Queensland University of Technology

Dear student,

Your learning experiences in nursing programs are important. I am conducting this survey to investigate your experiences of learning activities throughout your nursing studies. Results from this study will provide nurse educators with information to design teaching strategies to assist students to develop their self-directed learning abilities.

In this questionnaire, your name or student ID is not requested, so that your personal identity will not be revealed. The information provided by you will be used for research purposes only and presented as group information only. Your participation is voluntary. You have the right to refuse to participate or withdraw any time without penalty.

The questionnaire should take about 20 minutes to complete. When providing answers please put down what you believe, your frank responses are of great value. By responding to the questionnaire, you will be giving your consent to participate in the study. If you have any queries please contact me by emailing to mh.huang@student.qut.edu.au. Thank you very much.

Yours sincerely,

Mei-hui Huang
Please provide some information about yourself.

1. Your current undergraduate program:
   - [ ] 2-year post-junior college program
   - [ ] 4-year post-vocational school program

2. Gender: [ ] Male
   - [ ] Female

3. Age at last birthday: _____ years old

4. Place of birth: _________ (county or city, e.g. Pingtung County or Taipei City)

5. What is your previous education certificate?
   - [ ] 2-year junior college
   - [ ] 5-year junior college
   - [ ] Vocational high school
   - [ ] High school

6. What kind of nurse licences do you have?
   - [ ] Professional Registered Nurse Licence
   - [ ] Registered Nurse Licence
   - [ ] None

7. Have you had any clinical working experiences?
   - [ ] Yes, I have clinical experiences for _______ years
   - [ ] No

8. How many hours per week on average do you spend studying or preparing class assignments (attending class time is not included)?
   _________ hours.
**Questionnaire part one:**

This questionnaire is about your attitude towards your studies and your usual way of studying. Please circle a number between 1 (never) and 5 (always) which you believe is the most appropriate answer to you. The numbers stand for the following response:

1 — this item is never or only rarely true to you
2 — this item is sometimes true of you
3 — this item is true of you about half the time
4 — this item is frequently true of you
5 — this item is always or almost always true of you

<p>| | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1.</td>
<td>I find that at times studying gives me a feeling of deep personal satisfaction.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>2.</td>
<td>I find that I have to do enough work on a topic so that I can form my own conclusions before I am satisfied.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>3.</td>
<td>My aim is to pass the course while doing as little work as possible.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>4.</td>
<td>I only study seriously what’s given out in class or in the course outlines.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>5.</td>
<td>I feel that virtually any topic can be highly interesting once I get into it.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>6.</td>
<td>I find most new topics interesting and often spend extra time trying to obtain more information about them.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>7.</td>
<td>I do not find my course very interesting so I keep my work to the minimum.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>8.</td>
<td>I learn some things by rote, going over and over them until I know them by heart even if I do not understand them.</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>9.</td>
<td>I find that studying academic topics can at times be as exciting as a good novel or movie</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>10.</td>
<td>I test myself on important topics until I understand them completely.</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
11. I find I can get by in most assessments by memorising key sections rather than trying to understand them.  

12. I generally restrict my study to what is specifically set as I think it is unnecessary to do anything extra.  

13. I work hard at my studies because I find the material interesting.  

14. I spend a lot of my free time finding out more about interesting topics which have been discussed in different classes.  

15. I find it is not helpful to study topics in depth. It confuses and wastes time, when all you need is a passing acquaintance with topics.  

16. I believe that lecturers shouldn’t expect students to spend significant accounts of time studying material everyone knows won’t be examined.  

17. I come to most classes with questions in mind that I want answering.  

18. I make a point of looking at most of the suggested readings that go with the lectures.  

19. I see no point in learning material which is not likely to be in the examination.  

20. I find the best way to pass examinations is to try to remember answers to likely questions.
Questionnaire part two:

This questionnaire is related to general issues about your learning environment and experiences with self-directed learning activities. Please circle a most appropriate response to you. The numbers stand for the following responses:

1— you strongly disagree (SD) with the statement
2— you disagree (D) with the statement
3— you are unsure (U) with the statement
4— you agree (A) with the statement
5— you strongly agree (SA) with the statement

<table>
<thead>
<tr>
<th></th>
<th>SD</th>
<th>U</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>☹</td>
<td>☹</td>
<td>☹☺</td>
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</tbody>
</table>

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<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
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<tr>
<td>1</td>
<td>1</td>
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<td>3</td>
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<tr>
<td>7</td>
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<td>8</td>
<td>1</td>
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<tr>
<td>9</td>
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<tr>
<td>10</td>
<td>Students have a great deal of choice over how they are going to learn in this course.</td>
<td></td>
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</tr>
<tr>
<td>11</td>
<td>Our lecturers showed us how to identify relevant information.</td>
<td></td>
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<tr>
<td>12</td>
<td>It’s often hard to discover what’s expected of you in this course.</td>
<td></td>
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</tr>
<tr>
<td>13</td>
<td>We are generally given enough time to understand the things we have to learn.</td>
<td></td>
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</tr>
<tr>
<td>14</td>
<td>The staff makes a real effort to understand difficulties students may be having with their work.</td>
<td></td>
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</tr>
<tr>
<td>15</td>
<td>Students here are given a lot of choice in the work they have to do.</td>
<td></td>
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<tr>
<td>16</td>
<td>Teaching staff here normally give helpful feedback on how you are going.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>17</td>
<td>Our lecturers are extremely good at explaining things to us.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>18</td>
<td>The aims and objectives of this course are not made very clear.</td>
<td></td>
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</tr>
<tr>
<td>19</td>
<td>Teaching staff here work hard to make subjects interesting.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>20</td>
<td>There’s a lot of pressure on you as a student here</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Feedback on student work is usually provided only in the form of marks and grades.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>22</td>
<td>We often discuss with our lecturers or tutors how we are going to learn in this course.</td>
<td></td>
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</tr>
<tr>
<td>23</td>
<td>Staff here shows no real interest in what students have to say.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>24</td>
<td>It would be possible to get through this course just by working hard around exam times.</td>
<td></td>
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</tr>
<tr>
<td>25</td>
<td>We were taught how to find relevant information of this course and the reports.</td>
<td></td>
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<tr>
<td>26</td>
<td>There’s very little choice in this course in the ways you are assessed.</td>
<td></td>
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</tr>
<tr>
<td>27</td>
<td>The staff here make it clear right from the start what they expect from students.</td>
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</tr>
<tr>
<td>28</td>
<td>The sheer volume of work to be got through in this course means you can’t comprehend it all thoroughly.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>To do well on this course all you really need is a good memory.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>30</td>
<td>We know how to contact our teachers when we need to.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>It seems to me that the syllabus tries to cover too many topics.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>Too many staff asks us questions just about facts.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>This course really tries to get the best out of all its students.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>It is difficult to find the information that we need for this course.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Staff seem more interested in testing what you’ve memorised than what you’ve understood.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Our library and database provides enough information resources for us.</td>
<td>1 2 3 4 5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Questionnaire part three:

This questionnaire is about when you usually feel successful and satisfied with your studies. Please select a most appropriate answer based on your own situation. The numbers represent the degree of your feeling of success (or satisfaction).

<table>
<thead>
<tr>
<th>SD</th>
<th>U</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>☺</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

When did you feel most successful…

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>When a lecture or tutorial made you think about things.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>When you did almost no work and got away with it.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>When you got a higher mark than other students.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>When you learned something interesting.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>When you showed people that you were smart.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>When something you learned make you want to find out more.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>When you didn’t have to work too hard.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>When you were the only one who could answer the lecturer’s questions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

How satisfied did you feel when you…

<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Learned something new.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>Did better than the other students in the class.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>Realised you were getting through the course without having to work hard.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>Read something interesting.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>13</td>
<td>Realised you didn’t have to prepare for tutorials.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>14</td>
<td>Worked on a challenging task or assignment.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>15</td>
<td>Accomplished something that others couldn’t do.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
## Questionnaire part four:

This questionnaire is about the characteristics of your study behaviour. Please evaluate each item regarding the degree the item measures a characteristic of yourself, then circle a most appropriate answer of you between 1 (strongly disagree) and 5 (strongly agree).

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I solve problems using a plan</td>
<td></td>
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<td></td>
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<tr>
<td>2. I prioritise my work</td>
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<td></td>
<td></td>
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<tr>
<td>3. I do not manage my time well</td>
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<tr>
<td>4. I have good management skills</td>
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<tr>
<td>5. I set strict time frames</td>
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<tr>
<td>6. I prefer to plan my own learning</td>
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<tr>
<td>7. I am systematic in my learning</td>
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<tr>
<td>8. I am able to focus on a problem</td>
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<tr>
<td>9. I need to know why</td>
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<td>10. I critically evaluate new ideas</td>
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<tr>
<td>11. I prefer to set my own learning goals</td>
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<tr>
<td>12. I learn from my mistakes</td>
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<tr>
<td>13. I am open to new ideas</td>
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</tr>
<tr>
<td>14</td>
<td>When presented with a problem I cannot resolve, I will ask for assistance</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>I am responsible</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>I like to evaluate what I do</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>17</td>
<td>I have high personal expectations</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>18</td>
<td>I have high personal standards</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19</td>
<td>I have high beliefs in my abilities</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20</td>
<td>I am aware of my own limitations</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>21</td>
<td>I am confident in my ability to search out information</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>22</td>
<td>I do not enjoy studying</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>23</td>
<td>I have a need to learn</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>24</td>
<td>I enjoy a challenge</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>25</td>
<td>I want to learn new information</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>26</td>
<td>I enjoy learning new information</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>27</td>
<td>I set specific times for my study</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>28</td>
<td>I am self disciplined</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>29</td>
<td>I like to gather the facts before I make a decision</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>30</td>
<td>I am disorganised</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>31</td>
<td>I am logical</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>32</td>
<td>I am methodical</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>33</td>
<td>I evaluate my own performance</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>34</td>
<td>I prefer to set my own criteria on which to evaluate my performance</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>35</td>
<td>I am responsible for my own decisions/actions</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>36</td>
<td>I can be trusted to pursue my own learning</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>37</td>
<td>I can find out information for myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>38</td>
<td>I like to make decisions for myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>39</td>
<td>I prefer to set my own goals</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>40</td>
<td>I am not in control of my life</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>