

# **WHAT MAKES A DEEP AND SELF-DIRECTED LEARNER: EXPLORING FACTORS THAT INFLUENCE LEARNING APPROACHES AND SELF-DIRECTED LEARNING IN A PBL CONTEXT AT A MALAYSIAN PRIVATE UNIVERSITY**

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## **ABSTRACT**

This paper presents the findings of an empirical study of the relationships among students' individual characteristics, family contexts, self-efficacy beliefs, learning environments, approaches to teaching and teacher factors, approaches to learning, academic attainment, self-directed learning readiness and mental health at a Malaysian private university. For this paper, only the outcome measure of self-directed learning is presented. The study was guided by Kek's (2006) two-level integrated theoretical framework, designed to examine 'student and teacher ecological systems' and their influences on student learning and outcomes in higher education. Data from a large cross-sectional survey and structured in-depth interviews, for both students and teachers was analysed. Single-level quantitative analyses using partial least square path (PLSPATH) and multi-level analyses using the hierarchical linear modelling technique (HLM) were used. The survey data was drawn from a total of 44 PBL classrooms, 392 students and 32 teachers. Interviews were conducted with three teachers and 18 students. The PLSPATH findings revealed that parental involvement continued to influence how students learn and influence outcomes at the university level. A surface approach to learning was found to be related to poor quality outcomes and a deep approach to learning was related to high quality outcomes. The HLM analyses revealed which and how teaching factors directly and indirectly influenced approaches to learning and outcomes. The qualitative findings revealed types of parental involvement, peer group effects, complex relationships between memorising and higher cognitive processes in the learning process and effective teaching and learning environments for meaningful learning.

In this paper, we will present a summary of the contextual factors that influence approaches to learning, and the outcome measure of self-directed learning readiness through two models: one model for a deep approach to learning and self-directed learning, and one for a surface approach to learning and self-directed learning. Holistic measures to develop deep approaches to learning and self-directed learning are suggested.

## **KEYWORDS**

Contextual factors, family, learning environments, approaches to learning, self-directed learning, hierarchical linear modelling, path analysis

## **PBL, APPROACHES TO LEARNING AND SELF-DIRECTED LEARNING CONNECTION**

In this study, self-directed learning was examined as an outcome measure of Problem-Based Learning (PBL) as suggested by Blumberg (2000). While PBL is for many *synonymous with* self-directed learning, Blumberg (2000) qualifies this by noting that PBL can *facilitate the development* of self-directed learning, which implies an outcome, rather than a pre-condition.

To ascertain how students learn in a PBL situation, the 'student approaches to learning' field was utilised. Approaches to learning is one of the more strongly theorised areas of research in higher education (Tight, 2003). The learning approaches of students paradigm is directly derived from the students' perceptions of context and their qualitatively different responses to their own learning processes (Biggs, 2001). The concept of approaches to learning is about the 'what' and 'how' students learn, rather than how much they can remember (Ramsden, 1992). The term 'approaches to learning' today has evolved to refer to two things: the processes adopted during learning, which then directly determine the outcomes of learning and a predisposition to adopt particular processes (Biggs, 2001). Broadly speaking, these approaches to learning can be divided into surface and deep learning approaches.

According to Biggs (2001), a surface learning approach focuses on extrinsic or external motivation, and uses strategies that consume the least amount of time and effort to meet the requirements. In contrast, a deep approach to learning in general focuses on an intrinsic intention to comprehend, and is characterised by adopting strategies to maximise conceptual understanding. While it is clear that PBL will remain as a range of pedagogical practices, it is less clear which contextual factors foster meaningful learning and beneficial outcomes such as self-directed learning. In other words, what are these contextual factors that would enhance students' learning, and in particular, enhance how they approach their learning in more meaningful ways? What characterises the learning environments that may influence related outcomes such as self-directed learning, well-being, and intellectual achievement? How do such learning environments influence student learning levels and outcomes?

These are the questions addressed in this study. Specifically, this paper focuses on the influence and impact of personal and family contextual factors, and of learning environments on students' approaches to learning – deep or surface, and on the outcome measure of self-directed learning readiness in a private higher education context.

## **THEORETICAL FRAMEWORK**

The study was guided by Kek's (2006) proposed two-level theoretical framework to examine what she calls student and teacher 'ecological systems' and their influences on student learning and outcomes in higher education. The framework integrates the three different but complementary fields of learning environments, approaches to learning and approaches to teaching. The theoretical base was drawn from Bronfenbrenner's (1979) Ecological Theory of Human Development, Bronfenbrenner and Ceci's Bio-Ecological Model of Human Development (Bronfenbrenner & Ceci, 1994), Biggs' 3 P Model of Learning (2003), and Prosser, Ramsden, Trigwell and Martin's Model of Teaching (2003). This two-level theoretical framework is depicted in Appendix 1.

It is hypothesised that there are direct and mediated relationships between the students' individual characteristics, distal contexts (family, self-efficacy, university-level learning

environment), proximal contexts (curriculum and classroom-level learning environment), learning approaches and academic achievement, self-directed learning, and mental health. Given the scope of this paper, the findings about the impact of contextual factors on approaches to learning and self-directed learning are presented here only.

## **SUMMARY OF THE METHOD**

### ***Data Collection & Instruments***

Students and their teachers completed a questionnaire each so as to obtain two different levels of data for analysis. The students completed a questionnaire which asked for personal background information and questions about their perceptions of their families (drawing on Marjoribanks' (2002) Perceived Family Environment Scale), motivation (using Schwarzer and Jerusalem's (2002) General Self-efficacy Scale), university learning environment (using Dorman's (1999) University-Level Environment Questionnaire), classroom learning environment (adopting Johnson and McClure's (2004) newly modified version of the Constructivist Learning Environment Survey), approaches to learning (using the two-factor Study Process Questionnaire (SPQ-2F) by Biggs, Kember and Leung (2001)), and self-directed learning readiness (drawing on the Self-directed Learning Readiness Scale (SLDRS) by Fisher, King and Tague (2001)).

Meanwhile, the teachers completed a questionnaire about their personal backgrounds and their perceptions of teaching and school efficacy (drawing on the Ohio State Teacher Efficacy Scale (OSTES) by Tschannen-Moran and Woolfolk-Hoy (2001), the Collective Teacher Efficacy Instrument-12 (CTEI-12) by Goddard (2002), and the nine items from Caprara, Barnanelli, Borgogni and Steca's (2003) school efficacy scale), university learning environments (using Dorman's (1999) University-Level Environment Questionnaire), classroom learning environments (applying Johnson and McClure's (2004) newly modified version of the Constructivist Learning Environment Survey), approaches to teaching (using Trigwell and Prosser's (2004) new Approach to Teaching Instrument-25) and outcome measures of job satisfaction (applying a 4-item scale selected from the items used in Caprara et al.'s study (2003)) and mental health (using the Goldberg and Williams' (1988) General Health Questionnaire-12)).

### ***Data***

Evidence for this study was derived from questionnaires administered to and interviews obtained from both students and teachers of the International Medical University (IMU), Malaysia in 2004 and 2005. A total of 475 students, representing three study levels were sampled. Correspondingly, 44 teachers involved in teaching these students at the respective study levels were also sampled. The response rates for students and teachers were 82.5% and 72.7% respectively. A breakdown of the participants can be found in Table 1. A total of 18 students, ten female and eight male, participated in the interviews. Of these students, five students were from study level 1/ semester 1, four students from study level 2/ semester 4, and nine students from study level 3/ semester 5. At the teacher level, three teachers were interviewed. The profiles of the interview participants can be found in Table 2.

Table 1  
Breakdown of Student and Teacher Sample

Student Level								
Semester/ Study Level	Gender			Ethnicity				Total
	Male	Female	Total	Chinese	Malay	Indian	Others	
1/1	78	87	165	115	29	20	1	165
4/2	47	93	140	95	28	14	3	140
5/3	45	42	87	73	5	8	1	87
<b>Total</b>	<b>170</b>	<b>222</b>	<b>392</b>	<b>283</b>	<b>62</b>	<b>42</b>	<b>5</b>	<b>392</b>

Teacher Level						
Semester/ Study Level	Gender			Age		
	Male	Female	Total	>39 yrs	<39 yrs	Total
1/1	5	8	13	5	8	13
4/2	5	5	10	4	6	10
5/3	6	3	9	3	6	9
<b>Total</b>	<b>16</b>	<b>16</b>	<b>32</b>	<b>12</b>	<b>20</b>	<b>32</b>

### *The Problem-based Learning Context*

The IMU started as the International Medical College, the first and only private medical college in the Asia Pacific region in 1992, had university status conferred in 1999, and now has over 25 prestigious Partner Medical Schools (PMS) worldwide (International Medical University, 2005). At IMU (2005), PBL is the main curriculum delivery tool where teachers facilitate student learning in small groups to encourage teamwork, to problem solve, to learn and integrate acquired knowledge using simulated clinical problems, to become life-long learners. Each student at the university has to attend small group PBL sessions with a teacher, commonly known as the PBL tutor or facilitator, twice a week for a period of one and a half hours per session. In the PBL sessions or classrooms, the students learn about medical science by collaborating, developing learning issues to the problems posed, identifying relevant knowledge areas, generating hypotheses and performing research on the learning issues. This version of PBL could be termed as the 'classic version' (Hmelo & Evensen, 2000).

Table 2  
Profile of Interview Participants

Student Participants				
Outcomes	Gender		Ethnic Group	
	Female	Male	Chinese	Malay
<b>Approaches to Learning</b>				
Deep	8	2	9	1
Surface	2	6	6	2
<b>Self-directed Learning Readiness</b>				
High	5	4	9	0
Low	5	4	6	3
Teacher Participants				
Gender	Work Experience	Medical Degree	Approach to Teaching	
M	7 to 10 years	Yes	High student-focused/ Intermediate teacher-focused	
F	< than 1 year	No	High student-focused/ Low teacher-focused	
M	7 – 10 years	No	Intermediate student-focused/ High teacher-focused	

### *Statistical Analyses*

Prior to performing the statistical analyses, the validity and reliability of the instruments at the student and teacher levels were established.

The direct and mediated relationships and effects of the contexts on approaches to learning and outcomes at the student level were explored using path analysis. The aim of using path analysis was to direct analyses towards the examination and confirmation of specified causal relationships between variables (Keeves, 1988). The partial least squares path analysis (PLSPATH) program Version 3.01 (Sellin, 1989) was used for this analysis.

For the purpose of examining the impacts of teachers on student approaches to learning and related outcomes, a multi-level statistical modelling technique using a hierarchical linear model (HLM) procedure was used. In this way, HLM was able to produce better results, with each level estimating the effect of every variable in the model on the students' approaches to learning and related outcome measures. The procedure also was able to show the interaction effects between variables at two levels – individual or student level and teacher level. The HLM Version 6 program (Raudenbush, Bryk, Cheong, & Congdon, 2004) was used for this purpose.

### **FINDINGS SUMMARY**

The PLSPATH findings (M. A. Y. C. Kek, Darmawan, & Chen, 2007) revealed that parental involvement continued to influence how students learn and that it influences outcomes at the university level. A surface approach to learning was related to poor quality outcomes and a deep approach to learning was related to high quality outcomes. On the other hand, the HLM analysis revealed which and how teaching factors directly and indirectly influenced

approaches to learning and outcomes. Finally, the qualitative findings revealed types of parental involvement, peer group effects, complex relationships between memorising and higher cognitive processes in the learning process and effective teaching and learning environments for meaningful learning.

Both the quantitative and qualitative findings were integrated into two models of contextual influences: one model for a deep approach to learning and self-directed learning, and one for a surface approach to learning and self-directed learning, in a PBL setting of a private higher education context.

### ***Who is a Deep Learner?***

Appendix 2 shows the influences and impacts of the various contextual factors on a deep approach to learning and self-directed learning readiness. The diagram shows that students' adoption of a deep approach to learning in a PBL private higher education context is mediated by the relationship between their family contexts, general self-efficacy, university, curriculum, classrooms and self-directed learning readiness. Teaching factors have direct and interacted effects on a deep approach to learning.

A deep learner is linked to: (a) parents with low educational attainment; (b) parents who show great interest in students' university studies; (c) great personal confidence in their competence in coping and managing challenging environmental demands; (d) students' positive perceptions of shared control, critical voice, and student negotiation in the classroom; (e) teachers who employed student-focused approaches to teaching; and (f) full-time teachers.

The qualitative analyses suggest that the quality of parental involvement might be moderated by the extent of parental support. Students who reported deeper approaches to learning indicated that their parents had provided an affective and constructive family environment in supporting their university studies. Gender and ethnic differences are not significant in the adoption of deep approaches to learning. The qualitative analyses also suggest that unless the students hold higher conceptions of learning or constructive conceptions of learning, they tend not to utilise deep approaches to learning.

### ***Who is a Surface Learner?***

Appendix 3 shows the influences and impacts of the various contextual factors on a surface approach to learning and self-directed learning readiness. The paths to students' utilisation of a surface approach to learning are much different from the paths that influence adoption of a deep approach to learning. Firstly, a surface approach to learning is directly linked to gendered roles and ethnic cultural differences. Secondly, a surface approach to learning is directly linked to all three related outcomes of the full study – low academic achievement scores, poor mental health, and low self-directed learning readiness levels. This finding also establishes that a surface approach to learning tends to be linked to poorer quality outcomes – quantitatively (academic performance) and qualitatively (mental health and self-directed learning readiness). Thirdly, no significant relationships between teacher factors (teaching contexts) and a surface approach to learning could be established. The HLM analyses revealed that the differences in the surface approaches to learning scores were primarily situated at the students' level (within student differences).

A surface learner is directly linked to: (a) females; (b) non-Chinese students; and (c) a negative perception of the university characterised by a lack of peer support. The qualitative analyses revealed that surface learners with poorer academic achievement described their

parents as being more intrusive or directive in their support. The qualitative analyses also suggested that students who had purely utilised surface approaches to learning and obtained poor academic achievement scores, held lower or reproductive conceptions of learning. Furthermore, there were variations within surface approaches to learning. One group of students with high surface approaches to learning scores had persistently high academic achievement scores. These students emphasised the importance of memorising *and* understanding. In contrast, the students who mechanically memorised without understanding reported employing surface approaches to learning and obtained poor academic achievement scores.

## IMPLICATIONS

Based on this study's findings, our recommendations to improve teaching practices of full-time and part-time academic staff are as follows:

1. The establishment of a formal and systemic professional training and development program for both full-time and part-time academic staff, with the following goals:
  - To equip teachers with basic educational theories and concepts;
  - To help teachers better understand student learning;
  - To improve teachers' PBL skills such as facilitation, giving constructive feedback, probing questions;
  - To make teachers aware of and understand conceptions of teaching and learning;
  - To help teachers be aware of and understand the elements of an effective classroom environment;
  - To develop teachers' approaches to teaching; and
  - To develop overall teacher efficacy.
2. The systematic establishment and provision of the following resources and assistance to all students:
  - Create learning clinics or workshops to teach students academic learning skills such as time management; techniques to draw upon higher-order thinking skills (creative thinking, critical thinking); and information literacy skills.
  - Create a student 'peer mentoring' system consisting of students with deep approaches to learning assisting surface learners.
  - Create more interactions between teachers and students by allocating consultation time specifically in the teachers' workload allocations.
  - Create online discussion boards moderated by subject coordinators to allow students to discuss their learning issues or concerns, or create another avenue where students can access academic staff.
  - Create health or well-being programs such as stress management to assist students to better cope with the challenges of higher education.
3. The creation of an effective learning environment which develops deep approaches to learning among students should be one with the following specific characteristics:
  - Critical voice; where students have the opportunity and feel it is legitimate to express their opinions about the teacher and his/her teaching methods;
  - Shared control; where students participate in questioning, explaining, justifying, and evaluating their own and their peers' ideas; and

- Student negotiation; where students are involved in assessing the feasibility of new ideas.
4. The effects of parental involvement continued throughout students' tenure in the university. Therefore, formalising parental participation programs in university education policy would be an important and logical step for mutual dependence and exchanges between university and family, where consistent interactions are critical.

## CONCLUSION

To participate effectively in a 21<sup>st</sup> century global knowledge society and economy, and be adequately equipped, increasingly demands a combination of lifelong and self-directed learning skills in order to be able to respond to rapidly changing and often unpredictable circumstances. In this context, learners who do not employ deep approaches to learning may find themselves at a serious disadvantage when they are not ready for self-directed learning. This paper has suggested a series of holistic measures to begin to stimulate deep learning in an evidence-based and systemic manner.

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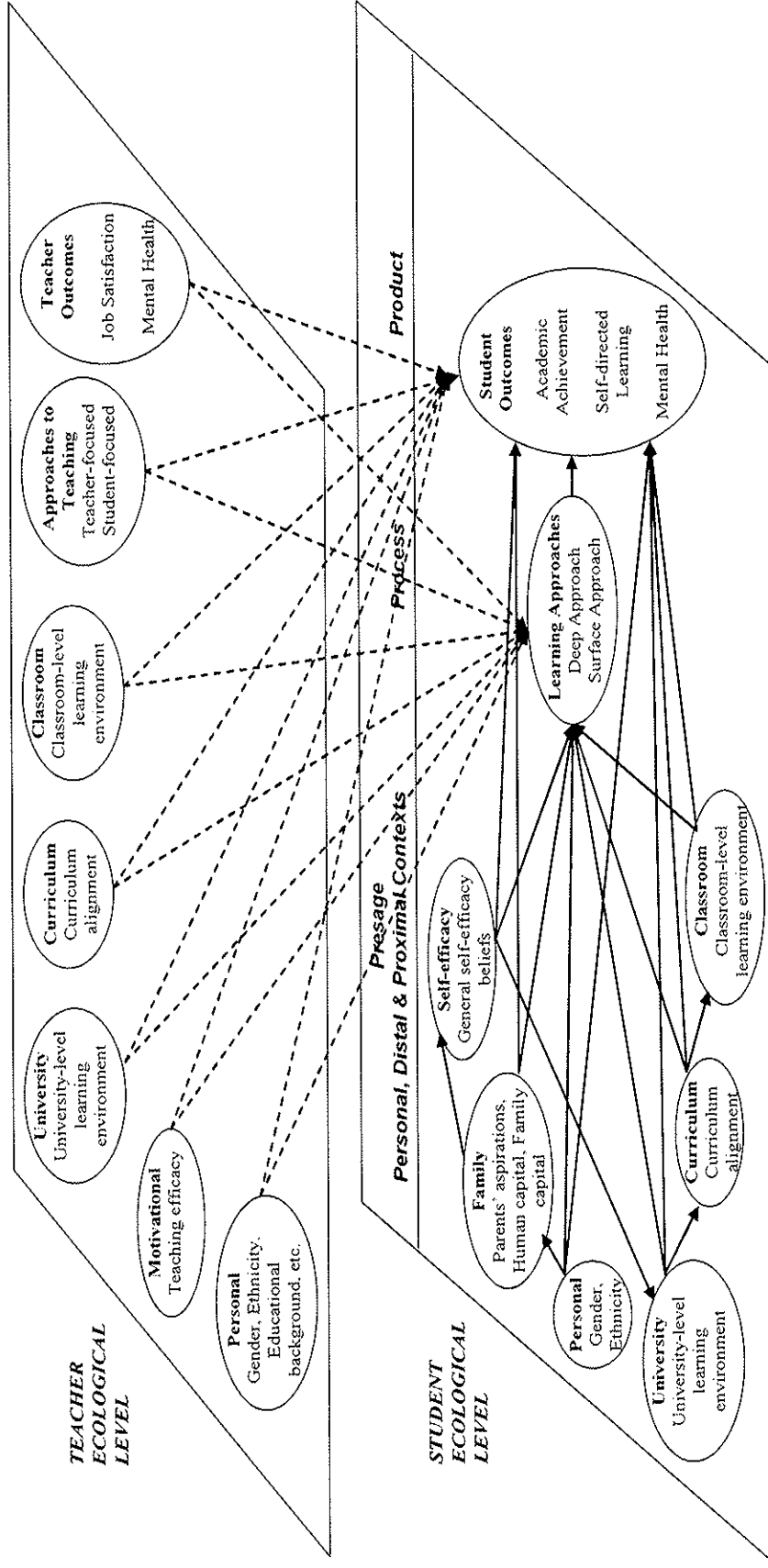
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# APPENDIX 1

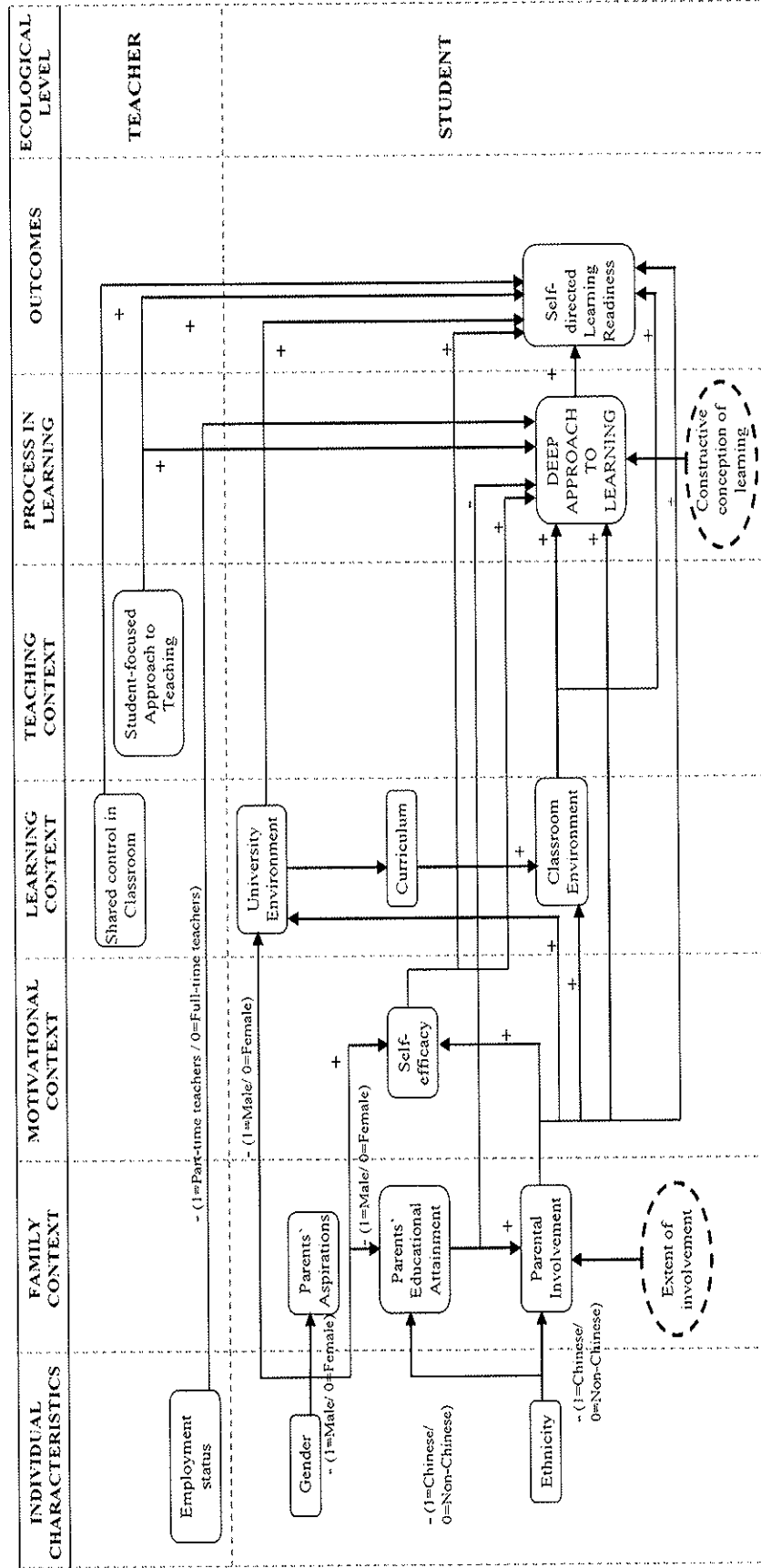
## Two-level Theoretical Model for Analysis



Source: Applied from Bronfenbrenner's Theory of Human Development (1979) and Bronfenbrenner & Ceci's Bio-Ecological Model of Human Development (1994), Adapted from Biggs' 3P Model of Learning (2003, p. 19), and Prosser, Ramsden, Trigwell & Martin's Model of Teaching (2002, p. 39)

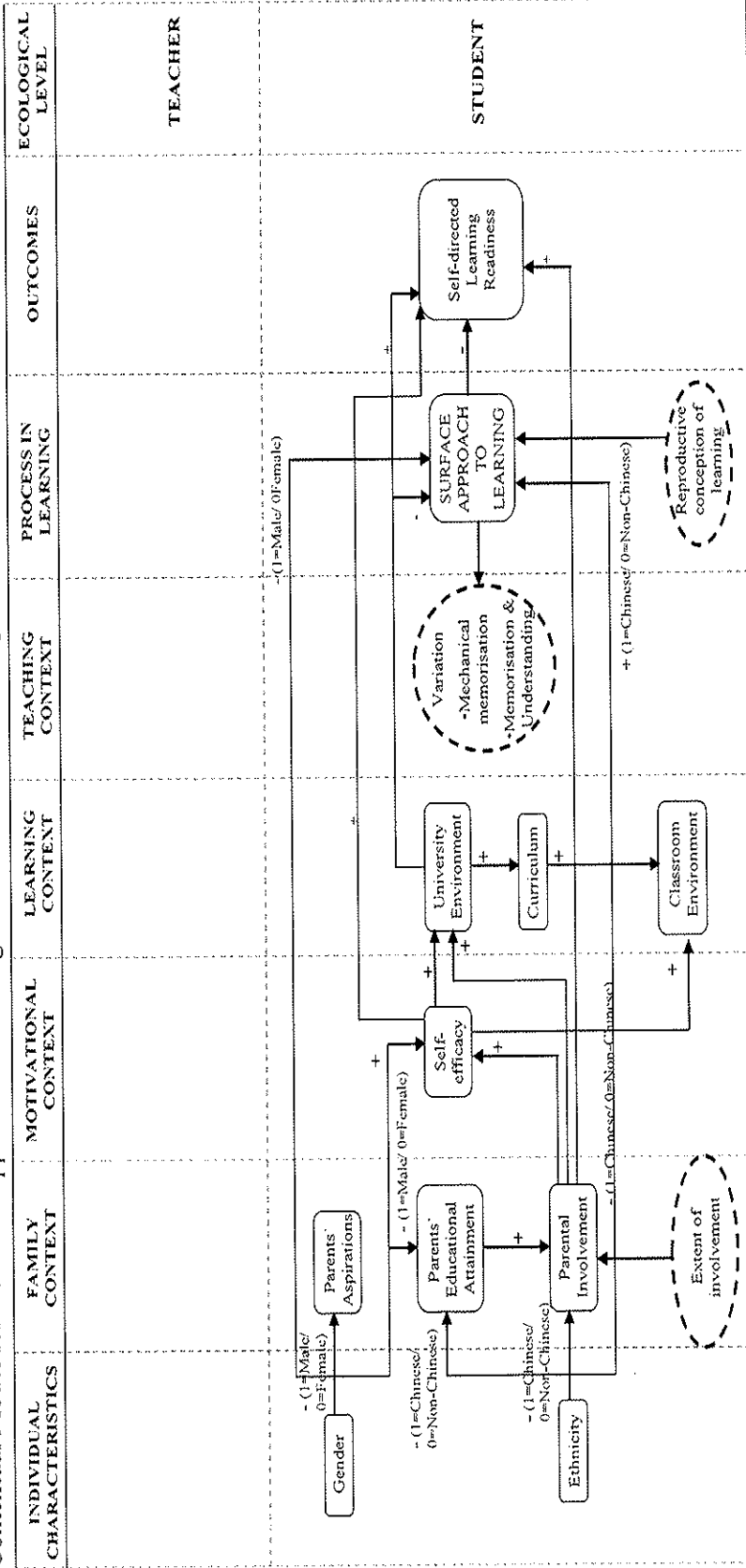
## APPENDIX 2

### A Contextual Model for a Deep Approach to Learning and Self-directed Learning Readiness



# APPENDIX 3

## A Contextual Model for a Surface Approach to Learning and Self-directed Learning Readiness



Note: From qualitative analyses

+/- Direction of relationship between variables

( ) Description of 1/0 variables

Source: Integrated from full study's quantitative and qualitative analyses (cross-level) interaction effects between teacher and student factors are not shown) - self-directed learning readiness outcome measure shown only