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Family, learning environments, learning approaches, and student outcomes in a Malaysian private university

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This article presents the quantitative findings from a mixed methods study of students and faculty at a private medical university in Malaysia. In particular, the relationships among students' individual characteristics, general self-efficacy, family context, university and classroom learning environments, curriculum, approaches to learning, and measures of students' academic achievement, self-directed learning readiness and mental health at the student level. Data were collected from 392 students attending a private medical university in Malaysia. The findings from the partial least square path analysis (PLSPATH) suggest that: (a) parental involvement continues to impact and influence student learning process, and related student outcomes, at the university level, and (b) a surface approach to learning is related to poor quality processes and outcomes and a deep approach to learning is related to high quality processes and outcomes.

Family, learning environments, learning approaches, higher education, student outcomes

INTRODUCTION

In the context of a changing world and striving to remain competitive, Malaysia initiated major changes to the higher education system (Zakaria, 2000). The impetus to the changes in higher education was the Malaysian government's strategic initiative *Wawasan 2020*, referred to here as 'Vision 2020'. Vision 2020 was initiated in 1991 to achieve the status of an industrialised and developed country in terms of its economy, national unity, social cohesion, social justice, political stability, system of government, quality of life, social and spiritual values, national pride and confidence (Mahatir, 1991). Under Vision 2020, education was positioned as the key engine to drive the nation from an economy based on labour-intensive and lower-end manufactured products to an economy based on knowledge by the year 2020.

From 1997 on, Malaysian higher education, which was once a closed system with only a few public universities has been transformed to an education landscape where private education, in particular private higher education among the ethnic groups, is thriving and strongly encouraged by the government (Lee, 1999; Zakaria, 2000). In 1997, there were only a total of 1,508 private educational institutions established (Zakaria, 2000). As of September 30, 2003, there were 531,099 students enrolled in 5,851 private educational institutions, of which 539 were private higher educational institutions, with 294,600 students enrolled and a teaching force of 14,346 teachers (Department of Private Education, 2003). The Malaysian private higher education

enterprise is set to grow further, as it aims to be a centre of educational excellence in the region (Lee, 1999; Rao, 1997).

However, these private higher educational institutions are perceived by the public at large as being 'for-revenue' or 'profit' institutions, in that the private sector tends mainly to offer programs that have high private benefits (profits) but fewer social benefits (Wilkinson & Yussof, 2005). This perception gives rise to another related public perception that 'poor quality education' is being provided by the private higher educational institutions compared to those provided by the public universities (Wilkinson & Yussof, 2005). This related perception may be further entrenched in the minds of the public at large due to the early years after independence in 1957, where the private sector education in Malaysia had merely catered for so-called 'dropouts' or provided language and religious education for minority groups (Wilkinson & Yussof, 2005).

In order to ensure quality education, all private higher educational institutions, in addition to having to register with and be approved by the Ministry of Education, must abide by the Parliament Acts such as the *Private Higher Educational Institutional Act 1996* and the *Education Act 1996*. In addition, the government of Malaysia established the National Accreditation Board (NAB) regulated under The National Accreditation Board Act 1996, as a national quality assurance agency responsible for governing the standard and quality of courses offered by the private higher educational institutions. These measures assist to reduce the negative perceptions that the quality of teaching and learning in private higher education is inferior and comprised of inferior learning contexts for dropouts.

While it is clear that private higher education will remain as a permanent feature in the Malaysian education landscape under the auspices of Vision 2020, if private higher education is to gain greater status and standing in society, there is a critical need to consider and understand the learning environments that can foster the aims of the nation. What then are the contextual factors of a learning environment that can enhance students' learning, in particular, how they approach their learning in a meaningful way? In particular, what are the learning environments that may influence related outcomes such as the intellectual capacity, well-being, and lifelong learning capacity of a student? Lastly, how do the learning environments influence student learning and outcomes?

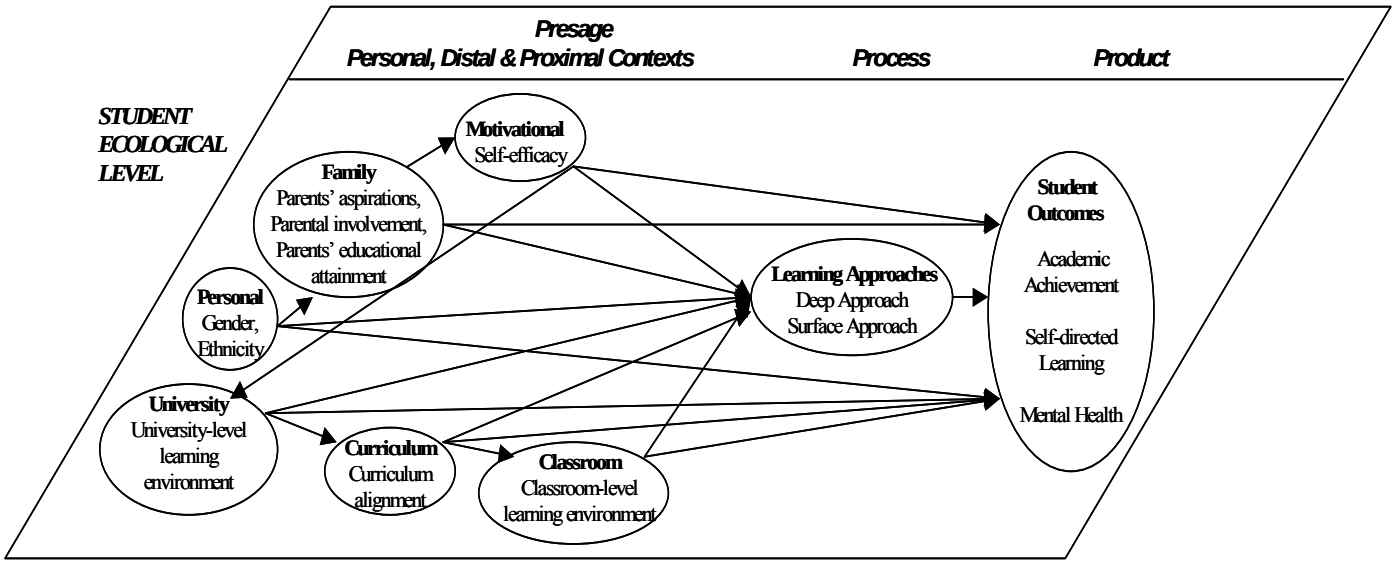
THEORETICAL MODEL FOR ANALYSIS

The study discussed in this paper was guided by Kek's (2006) proposed two-level theoretical framework which examined the student and teacher ecological systems and their influences on student learning and outcomes in higher education. The framework integrated constructs from three different but complementary fields of learning environments, approaches to learning and approaches to teaching. The theoretical base was drawn from the theories and theoretical frameworks of 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).

For the purpose of this paper, only the student level of the proposed two-level theoretical framework, depicted in Figure 1 is discussed. See Kek (2006) for full details of the theoretical base and theoretical framework.

Student Ecological Level

Bronfenbrenner's Human Development and Bio-Ecological (1979; 1994), and Biggs' 3 P (2003) concepts are applied to depict the interconnections between students' individual characteristics, the distal or more remote and proximal or immediate contextual factors (presage), approaches to learning (process) and outcomes (products) in higher education at the students' interrelated ecological level.



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)

Figure 1. Theoretical model for analysis – Student level

The theoretical model proposes that the proximal contexts are composed of the immediate learning contexts where teaching and learning occurs. The proximal contexts are the curriculum (perceptions of the curriculum alignment) and classroom-level learning environment (perceptions of the classroom-level learning environment). The distal contexts are the family context (parents' aspirations, parents' educational attainment and parental involvement), self-efficacy (general self-efficacy beliefs), and university-level learning environment (perceptions of the university-level learning environment). The distal and proximal contexts, in addition to the individual characteristics (gender and ethnicity) form the proposed presage factors.

The proposed presage factors are also conceptually placed in an orderly sequence. The placement starts with the individual characteristics, and the rest of the presage factors are sequenced from the distal contexts, moving into the proximal contexts. Hence, the sequence of the proposed presage factors is: (a) individual characteristics; (b) family context; (c) self-efficacy; (d) university-level learning environment; (e) curriculum; and (f) classroom-level learning environment.

The proposed presage factors are related to the hypothesised process of students' approaches to learning (a deep or surface approach to learning), which in turn are related to the products. Approach to learning refers to the processes adopted during learning, which directly determine the outcome of learning and predisposition to adopt particular processes (Biggs, 2001). Broadly, the two ways of relating to learning have become known as surface and deep learning approaches to learning. According to Biggs (2001), a surface learning approach focused on the extrinsic or external motivation, and used strategies that consumed the least amounts of time and effort to meet the requirements. In contrast, a deep approach to learning in general focused on the intention that was intrinsic in nature or the intention to comprehend, and adopted strategies to maximise conceptual understanding.

The products proposed for this research study are the students' academic achievement, self-directed learning readiness, and mental health outcomes.

Hypothesised Relationships and Influences

In this paper, the relationships among the contextual factors, student learning and a set of student outcomes (academic achievement, self-directed learning readiness, and mental health) at the student level were examined. 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.

METHOD

The data in this paper were collected from a study that focused on the student and teacher ecological systems and their influences on student learning and outcomes in a private medical university in Malaysia.

Data

Evidence for this paper was derived from questionnaires administered to 475 pre-clinical students, representing three study levels from the International Medical University, Malaysia (IMU) in 2004.

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 has over 25 prestigious Partner Medical Schools (PMS) worldwide (International Medical University, 2005). Like many private universities in Malaysia, its students are drawn predominantly from the Chinese ethnic group[1]. The medical program in Malaysia constitutes the pre-clinical phase where students have to undertake five semesters or 2.5 years of coursework. During the pre-clinical phase, the students learn basic medical sciences, clinical and communication skills, and aspects of medicine applicable to Malaysia. Upon successful completion of the foundation medical sciences, the students complete their medical degrees through clinical studies for another four to six semesters. Students can either complete their clinical studies in Malaysia at one of two IMU clinical schools at Batu Pahat or Seremban for a period of five semesters, and graduate with a MBBS from the IMU, or attend one of the 25 PMS for a period of four to six semesters, and graduate with the medical degree of the selected PMS overseas.

At the IMU, problem-based learning (PBL) was employed in the classrooms. PBL was the main curriculum delivery tool where teachers facilitated student learning in small groups to encourage teamwork, to solve problems, to learn and integrate knowledge acquired using simulated clinical problems, to do self-directed learning and become life-long learners (International Medical University, 2005). Each student at the IMU had 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 each session. In the PBL sessions or classrooms, the students learnt about medical sciences, and integrated the knowledge acquired through simulated clinical problems, known as the "PBL triggers" (International Medical University, 2005).

The final sample was: 179 students from 17 PBL classrooms in study level 1/ semester 1; 173 students from 16 PBL classrooms in study level 2/ semester 4; and 123 students from 11 PBL classrooms in study level 3/ semester 5. A 82.5 per cent response rate was obtained, with questionnaires received from a total of 392 students: 165 students in study level 1/ semester 1; 140 students in study level 2/ semester 4; and 87 students in study level 3/ semester 5. The response rates for semesters 1, 4 and 5 were 92.2 per cent, 80.9 per cent, and 70.7 per cent, respectively. From the final student sample, 43.4 per cent was male, and 56.6 per cent was female. The ethnic composition of the sample was 72.2 per cent Chinese, 15.8 per cent Malay, 10.7 per cent Indian, and 1.3 per cent Others. The average age of the students was 20.3 years old.

[1] Malaysia is a plural society. The 2000 Census reports the population of Malaysia to be 23.27 million and with an ethnic composition of 65.1% Bumiputera*, 26% Chinese, 7.7% Indian, and 1.2% Others (which include Eurasians, Sri Lankans and other communities) (Department of Statistics, 2000). *Bumiputera means "native of the soil". This term is used to include the Malays and other indigenous tribes such as the Ibans in Sarawak and the Kadazan Dusun and Bajau in Sabah.

Partial Least Path Analysis (PLSPATH)

The aim in using path analysis was to surpass correlation as mere association but to direct analyses towards the examination and confirmation of specified causal relationships between variables. Keeves (1988, p.724) suggested that the use of path analysis made it possible for educational researchers "to shift from verbal statements of a complex set of interrelationships between variables to more precise mathematical ones and to estimate the magnitude of the causal links involved." In this study, the purpose was to identify the pattern of relationships between students' individual characteristics (gender and ethnicity), parents' educational attainment, parents' aspirations, parental involvement, general self-efficacy, university-level learning environment, curriculum, classroom-level learning environment, learning approaches (deep and surface learning approaches), and academic achievement, mental health, and self-directed learning readiness outcomes.

The PLSPATH program was selected for this study because the technique has proved to be flexible and robust in testing complex models, did not require rigorous distributional assumptions of variables, accepted categorical and dichotomous variables, and recognised the use of complex cluster sample designs in data as is the case with this study (Sellin & Keeves, 1997). In addition, the PLSPATH program was appropriate for investigating complex models in an exploratory rather than a confirmatory fashion (Sellin, 1995, p.256). Although the approach is flexible, Sellin and Keeves (1997) argue that the PLSPATH program should not be seen to be exploratory and lacking in rigour because the PLSPATH program demands the development of a well-specified model for examination and estimation.

Therefore, the PLSPATH program was used to examine and estimate the direct and mediated relationships of the individual characteristics, family context, general self-efficacy, university and classroom learning environments, curriculum, learning approaches and outcomes at the student level. Separate analyses were also conducted for each study level in order to examine the constancy of measures across study levels through the use of replication (Sellin & Keeves, 1997, p.634). In this way, a further examination of development across study levels was enabled.

However, for this paper, only the final path result of the total student sample (n= 392) is presented and discussed.

Methodological Issues

The PLSPATH program is based on the partial least squares procedure (PLS) introduced by Wold (1985) as a method to maximise prediction and explanation of path models. The PLS procedure is conceptually related to principal component analysis, canonical correlation analysis, and regression analysis. According to Sellin (1995, p. 266), the PLS procedure is a "flexible and extremely powerful technique for the examination of path models with latent constructs measured by multiple indicators."

A PLSPATH model is formally defined by two sets of linear equations, termed the inner model and the outer model (Sellin, 1995). The inner model refers to the relationships between unobserved or latent variables (LVs). The outer model refers to the relationships between LVs and their associated observed or manifest variables (MVs).

There are two types of relationships between LVs and their associated MVs (Edwards & Bagozzi, 2000; Sellin & Keeves, 1997). The first type is where the constructs (LVs) are viewed as the causes of measures and they are referred to as 'reflective' or manifestations of a construct. That is, variation in a construct (LV) leads to variation in its measures. Arrows are drawn from the LV to MVs or known as the outward mode arrows to indicate this type of reflective relationships. The second type is where the measures are viewed as causes of constructs and they are referred to as 'formative'. That is, the construct is formed from the measures. Arrows are drawn from the MVs to the LV or known as the inward mode arrows to depict this type of formative relationships.

A number of indices are used to determine the strength of the relationships between the MVs and LVs. The most common indicator of the relationship is the loading, with other indices such as weight also being used (Sellin, 1989). To be effective, loadings should be reported where the outward mode is used, and weights should be reported where the inward mode is used (Sellin & Keeves, 1997).

The PLS procedure works by calculating an estimate for each LV, which is obtained from the corresponding MVs, thus, partitioning the hypothesised inner model into its component constructs. The PLSPATH program is iteratively processed until all the estimates are found to be stable. In this way, the relationships between LVs in the path model or the inner model signify the causal relationships between the LVs. The causal relationships are indicated by unidirectional arrows from the determining variables to the dependent variable, whereas determining variables which do not depend on any other variables are referred to as exogenous variables and are not indicated by any unidirectional arrows pointing toward the variable (Tuijnman & Keeves, 1997).

Data Preparation

Prior to modelling with the PLSPATH Version 3.01 program, data screening was undertaken to identify variables for missing data in excess of 20 percent (Keeves, 1997), so that these variables are omitted for effective analyses. The missing data are recommended to be replaced by assigning means (Sellin, 1989, p. 47). In this study, there were 12 cases or 3.8 percent missing data from the academic achievement variable, which were subsequently replaced with the mean.

The next step was evaluating the direction of the relationships of the MVs and LVs by examining either the factor loadings or correlations between the variables. The examination of the factor loadings, shown in Table 1 indicated that the directions between MVs and LVs used in the study were in the outward mode, with the exception of the university-level learning environment, which was in an inward mode due to the low correlation coefficients.

Table 1. Directions of relationships between MVs and LVs

Latent Variable (LV)	Manifest Variable (MV)	Zero-order Correlation (r)	Factor Loading	Direction between MV and LV
Family capital	Mothers' involvement Fathers' involvement	0.67**		Outward
Parent aspirations	Parent aspiration for program Parent aspiration for education	0.44**		Outward
University-level learning environment	Sense of membership Peer support	0.13*		Inward
Deep approach to learning	Deep motive Deep strategy	0.65**		Outward
Surface approach to learning	Surface motive Surface strategy	0.72**		Outward
Classroom-level environment	Personal relevance		0.66	
	Uncertainty		0.38	
	Critical voice		0.80	Outward
	Shared control		0.75	
	Student negotiation		0.67	

* $p < 0.05$, ** $p < 0.01$

Model Building, Refinement and Evaluation

Falk (1987) suggested that the best way to start model building using the PLSPATH was by drawing a path diagram of the data analysis to be undertaken. All LVs and their associated MVs were defined in the input file in such a manner that they were all systematically ordered.

In refining the model, two approaches were used. The first approach was to use the jackknifing method (Sellin, 1989). This method examines the effects that elimination of a variable has on the model parameter estimates. Sellin (1989) suggested that a path coefficient (betas) of 0.07 or

greater was considered to be significant in large samples or 0.10 for small samples. Darmawan (2003) further recommended that the path coefficient (betas), and corresponding weight and loading to exceed twice the corresponding jackknife estimate of the standard error at a 95 per cent confidence interval. For noteworthy paths, the path coefficient, and corresponding weight and loadings may be above 1.68 jackknife estimate of the standard error at a 90 per cent confidence interval.

The second approach was the use of minimal values for loading, weight and path coefficient proposed by Sellin and Keeves (1997). For the outer model, a weight of 0.10 is the minimum value for inward mode, and a loading of 0.30 is the minimum value for outward mode. For the inner model, a path coefficient minimum value of 0.05 to 0.10 is acceptable. In this manner, paths with a loading, weight and path coefficient smaller than the minimal values were removed from the model and only those paths were retained which contributed substantially to explaining a dependent LV.

In addition to examining point estimates such as loadings, weights, and inner model coefficients, fit indices were also used to indicate the predictive power for model evaluation. The indicators obtained from PLSPATH analysis, namely R^2 and jackknife standard error estimates are commonly used (Sellin & Keeves, 1997). The R^2 value represents the amount of variance explained in each endogeneous LV. It indicates the predictive strength of the inner model relationships. Jackknife estimates of standard errors provided in brackets in all the paths, together with the loadings, is indicative that all the estimates are substantial when considering the jackknife rule of thumb for refining models.

In order to evaluate the noteworthiness of specific LVs, the factor loadings (*l*) of the MVs, which reflect the specific LVs, can be examined. The size of the factor loading provides an indication of the relative contributions of the different MVs.

The key consideration guiding the development and refinement of the model is parsimony. In this context, parsimony refers to the creation of a model that is meaningful and well-fitting, and that contributes to prediction and explanation of variance (Sellin & Keeves, 1997).

Hypothesised Path Model

Figure 2 presents the hypothesised model derived from the theoretical model for analysis. In Figure 2, the MVs and LVs used in the model are also indicated, with MVs represented with small rectangular boxes, while the rounded rectangular boxes represented the LVs or constructs derived from the MVs. A summary of the MVs and LVs used is provided in Table 2.

The inner model depicted in Figure 2 represented the hypothesised relationships between the LVs, in a way that LVs at the left-hand side of the model influenced LVs assigned to the right-hand side in the path. Conversely, the LVs at the far most left (antecedent variables) were not influenced by LVs to the right of the path model. The criterion variables (outcomes) were placed on the furthest right.

From the theoretical model, it was proposed that the presage factors are the students' individual characteristics (gender and ethnicity), distal contexts of family (parents' educational attainment or human capital, parents' aspirations and parental involvement or family capital), self-efficacy (general self-efficacy), university-level learning environment (sense of membership in the university community and sense of peer support), and the proximal contexts of classroom-level learning environment (personal relevance, uncertainty, critical voice, shared control, and student negotiation) and curriculum (curriculum alignment).

The proposed presage factors are related to the hypothesised process of students' approaches to learning, which in turn are related to the products. The products proposed for this research study are the students' academic achievement, self-directed learning readiness, and mental health outcomes.

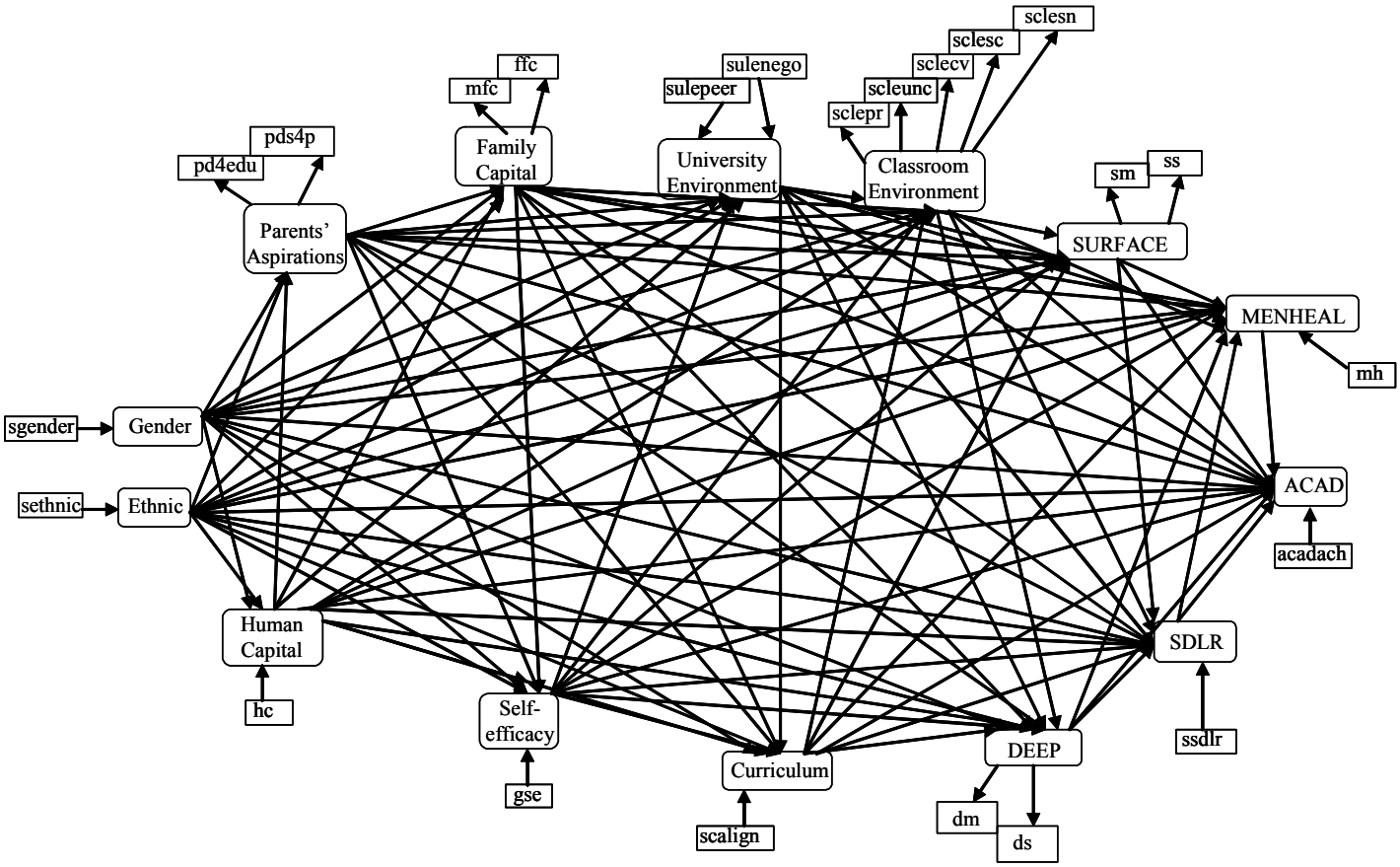


Figure 2. Hypothesised path model of individual characteristics, family context, general self-efficacy, university, classroom, learning approaches and outcomes

For the path analyses, gender and ethnicity are hypothesised as exogenous variables or antecedents, as they are not influenced by other LVs. The remaining presage factors and process are viewed as endogenous because they mediate the effects, or are influenced by other LVs.

The criterion variables are the product factors: academic achievement, self-directed learning readiness, and mental health. For path modelling, self-directed learning readiness and mental health are also hypothesised as the LVs influencing the final criterion variable of academic achievement. It is coherent to posit that students with high self-directed readiness scores, armed with the necessary knowledge and information, would be less stressed mentally and achieve good academic results.

Final Path Models

The patterns of relationships between the students' individual characteristics (gender and ethnicity), distal contexts of family (parents' aspirations, parents' educational attainment or human capital, and parental involvement or family capital), self-efficacy (general self-efficacy), university-level learning environment (sense of membership and sense of peer support), the classroom-level learning environment (personal relevance, uncertainty, critical voice, shared control, and student negotiation), curriculum (curriculum alignment), learning approaches (deep and surface learning approaches), and outcomes (self-directed learning readiness, mental health, and academic achievement) are examined.

The final path model for the total student sample shows their respective patterns of relationships of both outer and inner models. The information in each model represents the following:

Outer model (MVs): Factor loading or weights of outward or inward modes

Inner model (LVs): The causal paths with standardised path coefficients or beta, and jackknife estimates of standard error in brackets

Residuals: Represented in circles, are given by $\sqrt{(1-R^2)}$

Table 2. Summary of variables in path models

Theoretical Dimensions	Latent Variables	Manifest Variables	Description
Presage			
Individual characteristics	Gender	sgender	1= Male, 0= Female
	Ethnic	sethnic	1= Chinese, 0= Others
Family Context	Human Capital	hc	Parents' highest educational attainment levels
	Parents' Aspiration	pds4p	Perceived parents' desire for success in medical program: 1= Parents, 0= Others
		pd4edu	Perceived parents' desire for success in education: 1= Parents, 0= Others
	Family Capital[2]	mfc	Perceived mothers' involvement in studies
		ffc	Perceived fathers' involvement in studies
Self-efficacy	General self-efficacy	gse	Perceived general self-efficacy beliefs
University Context	University Environment	sulepeer	Perceived university-level learning environment on the scale of peer support
		sulenego	Perceived university-level learning environment on the scale of sense of membership
Classroom Context	Curriculum	scalign	Perceived alignment of curriculum
	Classroom Environment	sclepr	Perceived classroom-level learning environment on the scale of personal relevance
		scleunc	Perceived classroom-level learning environment on the scale of uncertainty
		sclecv	Perceived classroom-level learning environment on the scale of critical value
		sclesc	Perceived classroom-level learning environment on the scale of shared control
		sclesn	Perceived classroom-level learning environment on the scale of student negotiation
Process			
Learning Approaches	DEEP	dm	Deep learning approach on the scale of deep motives
		ds	Deep learning approach on the scale of deep strategies
	SURFACE	sm	Surface learning approach on the scale of surface motives
		ss	Surface learning approach on the scale of surface strategies
Product			
Outcomes	SDLR	ssdlr	Scores on self-directed learning readiness
	MENHEAL	mh	Scores on mental health (High = Poor Mental Health, Low= Good Mental Health)
	ACAD	acadach	Grades based on the university's 4-point grade system

For this study, the causal relationships between the LVs, that is, the inner models are of interest. The inner models results where the direct effect, total effect, and R^2 for each inner model equation are presented in Table 3. As mentioned earlier, only the results of the total student sample are presented and discussed in this paper.

FINDINGS

The following section presents the patterns of relationships of students' individual characteristics (gender and ethnicity), parents' educational attainment, parents' aspirations, parental involvement, general self-efficacy, university-level learning environment, curriculum, classroom-level learning environment, for each learning approach and outcome, of the total student sample.

[2] In the validation of the Family Capital instrument, one factor component was extracted to represent parental involvement measure. In the path analysis, this measure was re-assigned to form mothers' involvement and fathers' involvement, to indicate the differences in the involvement between mothers and fathers.

Table 3. Summary of direct and total effects for inner models

	Total Student Sample (N= 392)		
Latent Variables	**Direct**	**Total**	**R^2**
Human Capital			.04
Gender	-0.11	-0.11	
Ethnic	-0.14	-0.14	
Parents' Aspirations			.05
Gender	-0.21	-0.19	
Human capital	-0.13	-0.13	
Family Capital			.18
Gender			
Ethnic	-0.34	-0.36	
Human capital	0.21	0.21	
General self-efficacy			.04
Gender	0.13	0.13	
Family capital	0.16	0.16	
University Environment			.22
Gender	-0.15	-0.12	
Ethnic			
Parents' aspirations			
Family capital	0.24	0.30	
General self-efficacy	0.34	0.34	
Curriculum			.15
Gender			
Human capital	-0.12	-0.09	
Family capital			
General self-efficacy			
University	0.38	0.38	
Classroom Environment			.41
Gender			
Human capital			
Family capital	0.24	0.39	
General self-efficacy	0.23	0.35	
University	0.28	0.35	
Curriculum	0.20	0.20	
Deep Approach			.28
Ethnic			
Human capital	-0.12	-0.06	
Family capital	0.11	0.27	
General self-efficacy	0.26	0.37	
Classroom	0.32	0.32	
Surface Approach			.08
Gender	0.23	0.24	
Ethnic	-0.15	-0.14	
Human capital			
University	-0.13	-0.13	
Curriculum			
Self-directed Learning Readiness			.53
Gender			
Ethnic			
Family capital	0.09	0.31	
General self-efficacy	0.39	0.57	
University	0.18	0.26	
Classroom	0.10	0.17	
Deep approach	0.25	0.25	
Surface approach	-0.11	-0.11	
Mental Health			.18
Gender			
Parents' aspirations	-0.09	-0.09	
General self-efficacy	-0.17	-0.31	
University			
Curriculum			
Surface approach	0.15	0.18	
Self-directed learning readiness	-0.24	-0.24	
Academic Achievement			.08
Gender			
Ethnic	0.27	0.28	
University			
Deep approach			
Surface approach	-0.10	-0.10	

Total Student Sample

The path results of each learning approach and outcome for the total student sample are provided below. Figure 3 shows the final path model for the total student sample, and Table 3 shows the direct and total effects.

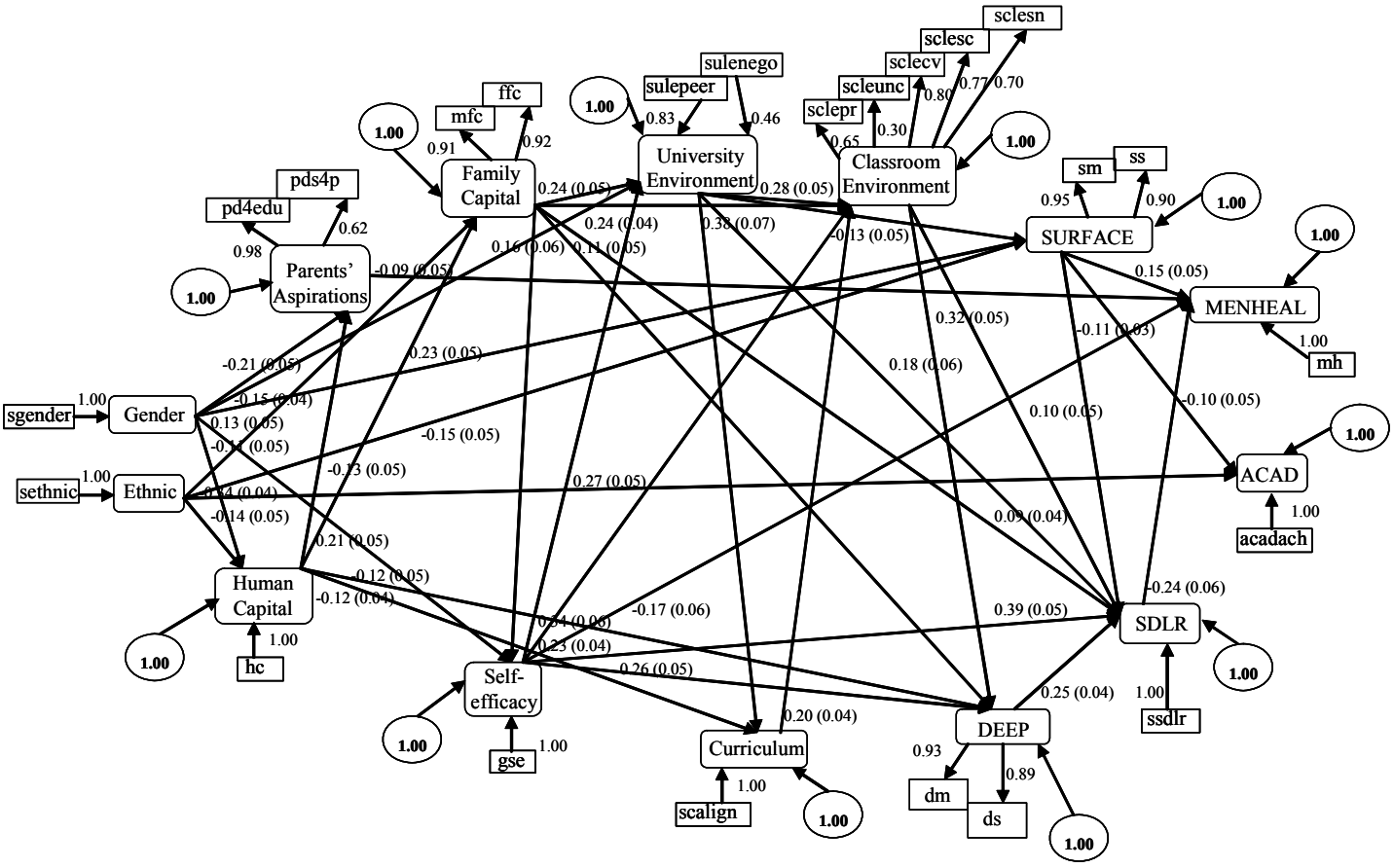


Figure 3. Path Diagram of Relationships for Total Student Sample (n= 392)

Deep Approach to Learning

Figure 3 shows that deep learning approach was influenced by classroom-level learning environment (β= 0.32), followed closely by general self-efficacy (β= 0.26). The other LVs identified to have direct effects on a deep learning approach were the negative effect of parents' educational attainment or human capital (β= -0.12) and parental involvement or family capital (β= 0.11). These variables in the inner model explained 28 percent of the variance of a deep learning approach.

Examination of the Direct Effects

Table 3 shows the direct and total effects for deep approach to learning. The most significant and critical factor in the deep learning approach was the positive and direct effect of the classroom-level learning environment. There was no indirect effect as the direct and total effects of the classroom-level learning environment were 0.32. This suggested that those students who adopted deep approaches to learning perceived the classroom learning environment had enabled them to employ deep approaches to learning.

When the size of the factor loadings of the MVs which reflect the LV, classroom environment, to indicate the relative contributions of the specific MVs, were examined, the path analyses indicated that personal relevance (l = 0.65) moderately, and critical voice (l = 0.80), shared

control (l = 0.77) and student negotiation (l= 0.70) largely contributed to a student adopting deep approaches to learning.

That is, a student was more likely to employ deep approaches to learning when the classroom learning environment was relevant to the students (personal relevance), fostered expression of opinions about the teacher (critical voice), encouraged active participation to question, explained, justified and evaluated ideas (shared control), and allowed assessment of new ideas (student negotiation).

In addition, another factor with sizeable total effect in influencing deep approaches to learning was general self-efficacy (direct effect= 0.26, total effect= 0.37). The students who had employed deep approaches to learning were highly self-efficacious.

The negative sign between parents' educational attainment or human capital (direct effect= -0.12, total effect= -0.06) and a deep learning approach suggested that students from families whose parents were not highly educated were more likely to employ deep learning approaches. However, the parents' low educational attainment were compensated for by parental involvement or family capital (direct effect= 0.11, total effect= 0.27), having a positive influence on a deep approach to learning. This finding indicated the importance of parental involvement in influencing students' adoption of deep approaches to learning in university study. An active involvement from parents in showing interest and support in their children's university studies influences how the students approached learning in higher education.

Examination of the Indirect Effects

Table 3 shows the result of the indirect effects (total effects minus direct effects) of the LVs found to influence a deep approach to learning. The strongest LV of classroom-level learning environment revealed only a direct effect (0.32) on a deep approach to learning. The other three LVs revealed both direct and indirect effects on a deep approach to learning: general self-efficacy (direct effect= 0.26, indirect effect= 0.11), parents' educational attainment or human capital (direct effect= -0.12, indirect= 0.05), and parental involvement or family capital (direct effect= 0.11, indirect effect= 0.16).

Of these variables, parental involvement or family capital's indirect effect of 0.16 was of sizeable significance and a critical indirect factor in influencing a student to adopt deep approaches to learning. The indirect effect of family capital was larger than its direct effect. That is, in addition to having a direct effect on a deep approach to learning, family capital critically influenced a student adopting a deep approach to learning indirectly through the following mediating paths, indicated in Figure 3 through:

(a) general self-efficacy,
(b) university and classroom,
(c) university, curriculum and classroom,
(d) general self-efficacy and classroom,
(e) general self-efficacy, university and classroom.

This finding revealed that the distal family context, in particular parental involvement, continued to play an important role in university education, both directly and indirectly. In this study, the path analysis showed that parental involvement was significant in influencing the adoption of deep approaches to learning, directly and more importantly indirectly. In other words, students who had come from families with high parental involvement were more confident, and reported the adoption of deep approaches to learning when they were in the university environment. In addition, when these students perceived that they had good peer support in the university environment (the factor loading of MV, peer support l= 0.83, in comparison to the sense of membership l= 0.46), they reported employing deep approaches to learning. This finding suggested that students who engaged in informal collaborative learning or informal group learning were more likely to adopt deep approaches to learning.

In summary, the path analyses for a deep approach to learning indicated that in a home environment with high parental involvement, students were more likely to adopt deep approaches to learning. When the students were in a formal learning context, the tendency to adopt a deep approach to learning depended on their perceptions of the classroom and university learning environments. Students employed deep approaches to learning when the classroom learning environment was perceived to be relevant to them (personal relevance), fostered expression of opinions about the teacher (critical voice), encouraged active participation among them to question, explain, justify and evaluate ideas (shared control), and allowed the assessment of new ideas (student negotiation). In addition, students tended to employ deep approaches to learning when they perceived that there was peer support in the university community (university-level learning environment).

Surface Approach to Learning

From Table 3 and Figure 3, three LVs were identified to have an impact on surface learning approach, namely gender (β= 0.23), ethnic (β= -0.15) and university environment (β= -0.13). The results indicated that being male was the most significant and critical factor in the adoption of a surface learning approach. The negative sign observed for ethnicity revealed that the non-Chinese students were more prone to employ surface approaches to learning. When the students entered a formal learning context, perceptions of a lack of peer support (l= 0.80) in the university environment influenced them to employ a surface learning approach.

The indirect effect of gender was 0.02, operating positively through the university environment. While the indirect effect of ethnicity was 0.01, operating positively through parental involvement or family capital and university environment, there was no indirect effect for the university environment. These results further indicated that the individual characteristics of gender and ethnicity were stronger contextual influences on the adoption of surface approaches to learning than the instructional contextual factors such as the curriculum and classroom-level learning environment. That is, a student who was male and non-Chinese was more likely to employ surface learning approaches.

In summary, the path results revealed that the individual characteristics of a person such as gender and ethnicity together with a lack of peer support in the university environment, were the significant factors in influencing a student adopting a surface approach to learning.

Self-directed Learning Readiness

Table 3 and Figure 3 show the path analyses for self-directed learning readiness outcome. The path model indicated a R^2 of 0.53 for the total student sample, explaining a substantial 53 percent of the variance of the outcome of self-directed learning readiness in all students. Similar to the case of the deep learning approach, there were a number of LVs that directly and indirectly influenced self-directed learning readiness.

Examination of the Direct Effects

The most significant and critical factor in influencing self-directed learning readiness was the positive and direct effect of general self-efficacy (direct effect= 0.39, total effect= 0.57). This suggests that students who had reported high self-directed learning readiness were highly self-efficacious.

Another factor with a sizeable direct effect was the deep approach to learning (direct effect= 0.25). There was no indirect effect. Students who reported as highly self-directed learners had employed deep approaches to learning.

The positive direct effect from the university-level learning environment (direct effect= 0.18, total effect= -0.26) indicated that students who reported high self-directed learning readiness scores had positive perceptions of the university, specifically in terms of peer support (l= 0.83). The

negative direct effect from surface approach to learning was –0.11, with no indirect effect. That is, students with low self-directed learning readiness scores had reported employing surface approaches to learning. The positive direct effect from the classroom-level learning environment (direct effect= 0.10, total effect= 0.17) also indicated that students who reported high self-directed learning readiness scores had positive perceptions of the classroom, specifically in terms of personal relevance (*l*= 0.65), critical voice (*l*= 0.80), shared control (*l*= 0.77) and student negotiation (*l*= 0.70).

Lastly, the distal contextual factor that had direct and indirect influences on self-directed learning readiness was parental involvement or family capital (direct effect= 0.09, total effect= 0.31). That is, students who reported high self-directed learning readiness scores came from families where their parents were highly involved in their studies.

Examination of the Indirect Effects

Table 3 shows the result of direct and indirect effects of the LVs found to influence self-directed learning readiness. Of all these indirect effectss, parental involvement or family capital presented the largest indirect effect in influencing a student's self-directed learning readiness level.

The indirect effect of parental involvement or family capital (0.21) was larger than its direct effect (0.09), making parental involvement or family capital a significant indirect factor in influencing self-directed learning readiness. That is, parental involvement or family capital, in addition to having a direct effect, indirectly influenced self-directed learning readiness through 11 mediating paths, shown in Figure 3. The indirect paths operated through the following through:

(a) general self-efficacy,
(b) a deep approach to learning,
(c) university,
(d) classroom,
(e) general self-efficacy and a deep approach to learning,
(f) general self-efficacy and university,
(g) general self-efficacy and classroom,
(h) general self-efficacy, university and classroom,
(i) general self-efficacy, university, classroom and a deep approach to learning,
(j) university and classroom,
(k) university, classroom and a deep Approach to Learning.

The indirect effects of family capital revealed that parental involvement or distal family context continued to play a critical role in university education, both directly and indirectly. In this case, parental involvement or family capital was significant in influencing the level of self-directed learning readiness among university students. That is, students who reported high self-directed learning readiness came from families whose parents were highly involved in their studies and consequently, indirectly influenced high levels of general self-efficacy.

In summary, students' high self-directed learning readiness scores were influenced by their parents' high involvement in their university studies, their possession of high general self-efficacy beliefs, their positive perceptions of the university and classroom learning environments, and their adoption of deep approaches to learning.

Mental Health

Table 3 and Figure 3 also show that mental health was influenced by four LVs. The path model indicated a R^2 of 0.18 for the total student sample, explaining a substantial 18 percent variance of mental health outcome in all students.

Examination of the Direct Effects

The factors that directly affected mental health were self-directed learning readiness (β= -0.24), general self-efficacy (β= -0.17), surface approach to learning (β= 0.15) and parents' aspirations (β= -0.09). The negative signs indicated low mental health scores, which signified good mental health. That is, students who reported good mental health (low mental health scores) were those students who reported high self-directed learning readiness scores, highly self-efficacious and had parents with high aspirations for them to succeed in medicine and education. However, those students who reported poor mental health were those who had employed surface approaches to learning.

Examination of the Indirect Effects

From Table 3, the factor with sizeable total and largest indirect effect was general self-efficacy (total effect= 0.31, indirect effect= 0.14). The remaining factors had trivial indirect effects of 0.00, 0.03, and 0.00 for parents' aspirations, surface approach to learning, and self-directed learning readiness, respectively. As shown in Figure 3, a student's mental health state was influenced directly by general self-efficacy (-0.17), and indirectly (-0.15) operating through the following mediating paths:

(a) self-directed learning readiness,
(b) a deep approach to learning and self-directed learning readiness,
(c) university and self-directed learning readiness,
(d) classroom and self-directed learning readiness,
(e) university, classroom, and self-directed learning readiness,
(f) classroom and a deep approach to learning,
(g) classroom, a deep approach to learning, and self-directed learning readiness,
(h) university and a surface approach to learning.

Students, who perceived themselves as highly self-efficacious, supported by peers in the university and in enabling classroom learning contexts, had employed deep approaches to learning and experienced good mental health. In contrast, students who similarly perceived themselves as highly self-efficacious, but encountered a negative university environment, adopted surface approaches to learning and this directly resulted in the student experiencing poor mental health.

In other words, students with high general self-efficacy and perceived supportive university and classroom learning environments, adopted deep approaches to learning and possessed high self-directed learning readiness scores, reported good mental health. In contrast, students with low general self-efficacy, perceived lack of peer support in the university environment and adopted surface approaches to learning, reported poor mental health.

Academic Achievement

Table 3 and Figure 3 show the outcome of academic achievement to be directly affected by two LVs. The larger of the two factors was ethnic (direct effect= 0.27) with a small indirect effect of 0.01. The other factor was the direct and negative sign of a surface approach to learning (direct= -0.10). There was a small indirect effect.

The results indicated that Chinese students had more academic successes than the non-Chinese students. The ethnic background of the students had the biggest, sizeable effect on academic achievement (total effect= 0.28). The small indirect effect (0.01) of ethnicity had operated through the family capital, university environment, and surface approach to learning, with the surface approach to learning directly resulting in low academic achievement.

The path analyses indicated that the students who employed surface approaches to learning, directly resulted in them achieving poor academic outcomes. It was revealed in the earlier path

analyses for a surface approach to learning that a lack of peer support (*l*= 0.80) in the university environment had influenced students to adopt surface learning approaches.

In summary, students who reported low academic achievement were those who employed a surface approach to learning, perceived that there was a lack of peer support and they were more likely to be from a non-Chinese ethnic backgrund. In other words, the path analysis results suggest that a low academic achiever is one who adopts a surface approach to learning, requiring additional educational resources such as peer support from the university community (outside classroom learning environment), and from a non-Chinese ethnic background.

SUMMARY OF RESULTS

- A deep approach to learning was influenced by the classroom-level learning environment (β= 0.32), general self-efficacy (β= 0.26), parents' educational attainment levels (β= -0.12) and parental involvement (β= 0.11). The indirect effect of parental involvement was 0.16, which was larger than its direct effect of 0.11. This finding indicated parental involvement to be a sizeable mediated factor in a student adopting a deep approach to learning.
- A surface approach to learning was influenced by three LVs, namely gender (β= 0.23), ethnicity (β= -0.15) and university environment (β= -0.12).
- Self-directed learning readiness was influenced by general self-efficacy (β= 0.39), a deep approach to learning (β= 0.25), university-level learning environment (β= 0.18), a surface approach to learning (β= -0.11), classroom-level learning environment (β= 0.10) and parental involvement (β= 0.09). The indirect effect of parental involvement was 0.21, which was bigger than its direct effect of 0.09. This finding indicated the parental involvement to be a sizeable mediated factor in a student's self-directed learning readiness.
- Mental health was directly affected by self-directed learning readiness (β= -0.24), general self-efficacy (β= -0.17), a surface approach to learning (β= 0.15) and parents' aspirations (β= -0.09).
- Academic achievement was directly affected by two LVs. The larger of the two factors was ethnicity (direct effect= 0.27) with a small indirect effect of 0.01. The other factor was the adoption of a surface approach to learning (direct= -0.10).

DISCUSSION

The path model analysis showed that learning was dynamic and inter-related. From a general perspective, the path analysis revealed that the approaches to learning which students adopted mediated the relationships between the students' individual characteristics, distal family contexts, general self-efficacy, curriculum, university-level and classroom-level learning environments, and related outcomes.

The negative and poor quality processes and outcomes were explained by the adoption of surface approaches to learning, while the positive and better quality processes and outcomes were explained by the adoption of deep approaches to learning.

The study showed that a deep approach to learning was directly influenced by: (a) parents with low educational attainment; (b) parents who showed great interest in students' university studies; (c) students' great personal confidence in their competence in coping and managing challenging environmental demands (general self-efficacy beliefs); (d) students' positive perceptions of the classroom particularly characterised by shared control, critical voice, and student negotiation (classroom learning environment). It also influenced directly (e) high level of self-directed learning readiness; and (f) indirectly good mental health.

In contrast, the paths to students' utilisation of surface learning approaches and influences on outcomes were different from the paths that influenced adoption of a deep approach to learning. First, surface approach to learning was directly influenced by gendered roles and ethnic cultural

differences and negatively by perceptions of the university environment. Secondly, surface approach to learning directly influenced all three related outcomes with low academic achievement scores, poor mental health, and low self-directed learning readiness levels. Overall, the study showed that a surface approach to learning was directly related to: (a) female students; (b) students of non-Chinese ethnicity; (c) students' negative perceptions of the university characterised by a lack of peer support (university environment); and gave issue to (d) poor measures of academic achievement, low self-directed learning readiness and poor mental health outcomes.

More importantly, the present study contributes to the study of student learning through the path findings which revealed that the distal or more remote family context influenced student approaches to learning, and subsequently, the students' cognitive and affective outcomes in higher education. Most of the time, the effects of family were indirect but the impacts were sizeable. In particular, this was demonstrated in the importance of parental involvement in the students' adoption of deep approaches to learning and development of high self-directed learning readiness levels.

This was despite the path analysis showing a negative relationship between parents' educational attainment and a deep learning approach. That is, students with parents of low educational attainment reported higher deep approaches to learning scores than students with parents of high educational attainment. This finding is consistent with Biggs' (1987) large data study where the results revealed that university students whose parents had had only primary education reported the highest deep approaches to learning scores when compared to students of parents with post-secondary education who reported lower scores on surface and on deep approaches to learning.

However, the path analysis from the present study further revealed that the parents' low educational attainment levels were eventually compensated by the impact of parental involvement to exert a positive influence toward a deep approach to learning through their children's general self-efficacy beliefs. The path analysis signified that an active involvement by the parents in supporting the students in their university learning motivated the students to be confident learners (general self-efficacy) and thus indirectly to adopt a deeper approach to learning.

This finding suggested that the lack of financial resources (some form of economic hardships due to inaccessibility to economic resources related to low educational attainment) provided in the students' households did not hinder their learning and achievements if their parents provided resources to these students, in the form of being interested and being attentive to their studies in the university (parental involvement or family capital). This finding lends support to Bronfenbrenner's general proposition that the family factor could affect university students' development, throughout their life, where there was the "establishment of strong attachment, support and involvement from their parents or primary caregivers" (Bronfenbrenner, 2005, p.9), because the parents were committed to the students' well-being and development. Such attachments enabled the university students to "internalise their parent's activities and expressed feelings of affection, which in turn motivated their interest and engagement in related activities" in the learning settings (Bronfenbrenner, 2005, p.9).

Thus, the demonstrated relationship between parental involvement or distal family context and student approaches to learning revealed in the present study contributes to the field of student learning by providing another window on the psychological and social mechanisms of environmental factors in predicting students' success in higher education. The nature of the relation between parental involvement, deep approaches to learning and self-directed learning also supports Bronfenbrenner and Ceci's (1994) theoretical proposition that the proximal processes as the primary engines of outcome can only occur when the distal environmental resources are jointly considered and determined.

This study using path analysis at the student level has revealed the importance of the family context in influencing how university students approached learning and related outcomes. Most of the literature on family had overwhelming evidence focusing on young children and early adolescence. The present study's findings have revealed that parents can still be important in promoting meaningful outcomes in their children's education, even at the university level. This study further endorses Marjoribanks' (2002, p.1) claim that "it is generally agreed that if parents are involved positively in activities associated with children's learning then the school outcomes of those children are likely to be enhanced" and extends the claim to outcomes at the university level.

In the Malaysian context, the present investigation supports the need for proper governance and evaluation of the credibility of private universities. By showing the particularly important relationship between parental involvement or family environments and student learning and related outcomes, at the university level, the study provides impetus to the Malaysian private higher education sector to understand further the factors that influence a university student. It is the distal or more remote, as well as, the proximal or more immediate factors in the learning environments that need to be considered. The private higher education administrators need not just be overly engrossed about having the most appropriate facilities or most advanced equipment in the university and classroom learning environments, but also be concerned about understanding fully the total learning environment of their students – the distal and proximal learning environments – that are potentially related to an outcome.

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