

Academic Self-Concept and Academic Achievement among University Students

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ABSTRACT

The purpose this study was to investigate academic self-concept and academic achievement among university students. The academic self-concept information among university students was collected using the Liu and Wang (2005) academic self-concept scale which was composed of two sub-scales; academic confidence and academic effort scales. The study was conducted on 394 university students; males and females from different levels of study and faculties in a public university in Malaysia. MANOVA was used to analyse the collected data and the results revealed that there was a statistically significant effect of gender on academic effort and academic achievement, while also a statistically significant difference was shown in faculties on academic achievement. Again a difference was noted in the interaction between gender, faculties, and levels of study on academic achievement. The Post Hoc results indicated that a statistically significant difference existed in between the faculties Arts and Human Sciences.

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Keywords:

Academic Self-Concept, Academic Achievement, University Students, Malaysia

Introduction

Self-concept is a general view about oneself across various sets of specific domains and perceptions based on self-knowledge and evaluation of values formed through experiences in relation to one's environment (Eccles, 2005). Academic self-concept is referred to as a person's self-evaluation regarding specific academic domains or abilities (Trautwein, et al. 2006). In other words, academic self-concept is how students do school work or feel about themselves as learners (Guay, 2003; Harter, 1998). Academic self-concept studies were pioneered when Shavelson, et al. (1976) developed a multifaceted hierarchical model of self-concept in which they divided the self-concept into academic and non-academic self concepts (Marsh & Parker, 1984; Shavelson, et al. 1976).

The construct of self-concept is derived from the self-worth theory (Peixoto 2003). Self-concept is associated with a wide range of performance indicators (Peixoto, 2003; Jackson, et al. 2001). These include sets of characteristics, attributes, qualities and deficiencies, capacities and limits, or values and relationships that the subject knows to be descriptive of him/her self and which he/she perceives as data concerning his/her identity (Marchargo, 1991). Self-concept is also composed of the academic, social, emotional, and physical dimensions (Lewis & Knight, 2000; Mui, et al. 2000). The domain-specific perceptions of self-concept (academic, physical, and social) are organized in a hierarchical structure with the general self-concept at the top of the hierarchy (Skaalvik & Skaalvik, 2002; Shavelson, et al. 1976). More contemporary researches in the field self-concept have also been directed towards academic self-concept and its development (Trautwein, et al. 2006; Marsh, et al., 2002; Tymms, 2001; Cheng, & Watkins, 2000).

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According to research it has been noted that as students grow older their academic self-concept becomes more stable (Guay, et al. 2003). In a study by Liu and Wang (2005) it was noted that academic self-concept tends to decline from early to mid adolescence and also extends to adulthood. Marsh (1989) explained that academic self-concept reaches its lowest point in middle adolescence, but also, he found out that academic self-concept increase through early adulthood. Academic self-concept varies as students move through grades in which their academic self-concept tends to rise in the direction of their academic achievement (Liu & Wang, 2005; Jacob, et al. 2002), whereas others studies highlight that it tends to become weaker (Marsh et al., 2002; Marsh & Yeung, 1997). It has been discovered that academic self-concept has a relationship with academic achievement (Awad, 2007; Tan & Yates, 2007; Marsh, 2004; Cokley, 2000). However, although various researchers concur with the academic self-concept's correlation with academic achievement, only a few studies have been done to highlight whether there is a difference in the subscales of academic self-concept on academic achievement across gender, levels of study, and faculties in which the students study in the universities.

In several studies on gender differences in academic self-concept it has been reported that males and females possess different beliefs about their academic competencies (Ireson, et al. 2001; Wigfield, et al. 2001; Marsh, 1989), with males showing higher academic self-concept than females (Kling, et al. 1999). Different studies have also posited that males tend to have higher academic self-perceptions in science courses while females have higher academic self-perceptions in non-science courses (Harter, 1999; Marsh, 1989). Jacob, et al. (2002) highlighted that gender differences in academic self-perceptions start as early as elementary school and remain stable through adolescence to adulthood. In reference to this situation, most of the university students are adults whose academic self-concept can be highlighted in the same way. In a paper by Marsh (2006), he highlighted that small stereotype gender differences linearly decline in mean levels of academic self-concept with age and modest differentiation between academic competencies. Also, this is the same situation in other groups defined by academic self-concept on academic achievement (Worrell, et al. 1999).

Self-Concept and Academic Achievement Theories

According to developed theories and models that explain academic self-concept and academic achievement, there has been no much proof of whether prior academic self-concept influences academic achievement or, prior academic achievement causes subsequent academic self-concept. In the self-enhancement model, academic achievement is due to the consequence of academic self-concept. The skill-development model highlights that academic achievement influences academic self-concept (Marsh, 2006; Marsh, et al. 2002; Marsh, et al. 1999). Lastly, according to Guay, et al. (2003) both academic self-concept and academic achievement directly influence each other, that is, they are reciprocal. The debate among researchers concerning whether prior academic self-concept influences academic achievement, or, prior academic achievement results into subsequent academic self-concept has been considered an egg-chicken question (Marsh, et al. 2002).

Purpose of the study. The study was to investigate the academic self-concept scores on the academic achievement among university students. The study was to find the effect of the dimensions of the academic self-concept on academic achievement among students in universities across gender, faculties, and levels of study for the students.

In analysis of academic self-concept and academic achievement among university students, the study tried to understand whether there was a difference among students in academic self-concept which has been studied to be an influential factor in their academic achievement. It was assumed in this study that as there is a difference in university students in terms of gender (males and females), levels of study (undergraduates and postgraduates), and in the faculties (Arts, Human Sciences, and Sciences), there might be a difference in the students' academic self-concept which could influence their academic achievement. For the study, the faculty of Education and the faculty of Laws were taken to be Arts faculties while the faculties of Economics and Islamic Revealed Knowledge were categorized as Human Science faculties. For science faculties; faculties of Engineering, Architecture and Environmental Design, and Information and Communication Technology were also grouped together.

Research Questions. The study tried to answer two research questions; (a) is there a statistically significant difference in academic confidence, academic effort, and academic achievement scores of university students across gender, levels of study, and their respective faculties? (b) Is there a statistically significant mean interaction between students' gender, levels of study, and faculties in which they study with their academic confidence, academic effort, and their academic achievement?

Hypotheses. The study had two hypotheses when it was being conducted which included; (a) there is no statistically significant difference in academic confidence, academic effort, and academic achievement among university students across gender, levels of study, and their respective faculties. (b) There is no significant interaction between gender, levels of study, and faculties across academic confidence, academic effort, and academic achievement among university students. These hypotheses acted as the basis to conduct the study.

Methods

Sample

The data was collected from 394 students from a public university in Malaysia. The sample comprised of 167 (42.4%) males and 227 (57.6%) females. For the levels of study, the postgraduates were 166 (42.1%) while undergraduates were 228 (57.9%). Again, the composition of the sample was from the Arts faculties 130 (33.0%), the Human Sciences faculties 162 (41.1%), and 102 (25.9%) from the purely science faculties. All the students were randomly selected from their respective groups. From all the faculties the students were randomly selected from the different departments in their respective faculties making the sample adequate for MANOVA analysis.

Table 1: Descriptive statistics of the independent variables in the study

		Frequencies	Percentage (%)
Gender	Males	167	42.4
	Females	227	57.6
Level of study	Undergraduate	228	57.9
	Postgraduate	166	42.1
Faculty	Arts	130	33.0
	Human Sciences	162	41.1
	Sciences	102	25.9

Instrument

The original academic self-concept scale by Liu and Wang (2005) was used which had two sub scales; (a) academic confidence, and (b) academic effort, each with 10 items to collect the students' academic self-concept information. The items included both negatively and positively worded items to avoid the same answers from the students. Both academic confidence and academic effort items were mixed in the scale; academic confidence items taking odd numbers (1, 3, 5, 7, 9, 11, 13, 15, 17, 19), while academic effort items taking even numbers (2, 4, 6, 8, 10, 12, 14, 16, 18, 20). In the same questionnaire, the students were requested to report their current Cumulative Grade Point Average (CGPA) which was used as a measure of their academic achievement. They also stated their gender (male or female), levels of study (undergraduate or postgraduate), and their respective faculties (Arts, Human Sciences, or Sciences). From the data collected, .795 and .802 were got for both validity and reliability of the instrument respectively.

Procedure

The researcher with the help of various research assistants moved to the various faculties of the university in one day and collected data from the students who came to attend lectures. The students were requested to fill the academic self-concept scale which also had a part for their demographic data. The

students who participated in the study were also requested to sign a short consent form before they would fill the questionnaire. The data which was collected was analyzed and presented as the results in this study.

Data analysis. The data collected was analyzed using SPSS 17.0 to test the hypotheses. The study tested for the difference and interaction effect between the variable in the study.

Findings

To find the effect in between the different variables, a Multivariate Analysis of Variance (MANOVA) was used. As a requirement for MANOVA, preliminary assumption checks were done to check on the multivariate outliers, linearity of the data, normality, multicollinearity, the homogeneity of covariance, and variances-covariances.

The Mahalanobis distance for the dependent variables was calculated and the maximum value (4.85) was smaller than the critical value (7.82), meaning that the data did not have multivariate outliers. According to the scatter plot generated from the data, it was showed that the data met the assumption of linearity. To assess the normality of the data a Kolmogorov-Smirnov test was performed and this revealed that the data was normally distributed. Also, the sample size was adequate in which there were enough cases (more than 3 in each cell), which would give leverage to the violation of the normality assumption. On the issue of multicollinearity the variables under study were found to be moderately correlated; academic effort was moderately correlated to academic confidence ($r = .45, p = .01$), and to academic achievement ($r = .58, p = .01$). Also, academic confidence was moderately correlated to academic achievement ($r = .32, p = .01$). This was an evidence of the absence of multicollinearity in the variables under study (Field, 2005).

Checking on the assumption of covariance matrices, a univariate test of equality of variances (Levene's test of equality of error variances) for all the dependent variables was not significant ($p > .05$) meaning that there was equality in the variances. A preliminary assumption check on the Box's test of equality of covariance and variance-covariance matrices was done to compare between groups (Field, 2005), which also indicated that there was no violation in the homogeneity of the covariance matrix assumption. This was because the Box's test of equality of covariance was also found not to be significant ($p > .05$). This revealed that the variance-covariance matrices are the same in all the three groups, meaning that the assumption of homogeneity of covariance matrices was met (Field, 2005). According to the data collected it was concluded that all the assumptions were met for the data to be analyzed using Multivariate Analysis of Variances (MANOVA).

The descriptive statistics of the study about students' academic confidence, academic effort, and academic achievement across gender, faculties, and levels of study are highlighted in table 2. The sample, mean, and standard deviations for each group are also revealed.

The results from the MANOVA revealed that there was a statistically significant difference in gender (Pillai Trace = .014, $F(1, 394) = 7.052, p < .017, \eta^2 = .018$) on academic effort, and also, the effect of the different gender (Pillai Trace = .014, $F(1, 394) = 6.432, p < .017, \eta^2 = .017$) on academic achievement was statistically significant as in table 3. This indicated that the effect of gender on academic effort and academic achievement was different for female participants than it was for the males. It was again observed from the results that there was a statistically significant difference in faculties (Roy's Large Root = .030, $F(2, 394) = 4.304, p < .017, \eta^2 = .022$) on academic achievement. This shows that the difference in the effect of the faculties on academic achievement was different in the different faculties (Arts, Human Sciences, and Sciences).

Also, an effect of the interaction between gender, faculties, and levels of study (Roy's Large Root = .036, $F(2, 394) = 4.305, p < .017, \eta^2 = .022$) on academic achievement was noted to be statistically significant. This means that the difference in academic achievement was brought about by the interaction between gender, faculties, and the levels of study for the students. According to the results the mean Pillai Trace and Roy's Largest Root characteristics indicated that the independent variables and the multivariate combination of the dependent variables shared 2.0% of the variance (Partial Eta Squared) in academic achievement and academic effort of the university students.

Table 2: Descriptive statistics for gender, levels and faculties of study in respect with academic confidence, academic effort, and academic achievement among university students

	Faculty	Level	N	Mean			SD		
				Males	Females	Total	Males	Females	Total
Academic Confidence	Arts	Undergraduate	78	32.89	34.15	33.55	7.72	6.66	7.16
		Postgraduate	52	33.58	32.88	33.13	7.83	6.90	7.18
	Human Sciences	Undergraduate	74	33.46	34.06	33.80	6.12	7.86	7.10
		Postgraduate	88	33.62	34.89	34.22	5.78	6.40	6.08
	Sciences	Undergraduate	62	34.53	33.13	33.52	7.37	6.16	6.50
		Postgraduate	40	34.50	34.50	34.50	6.54	9.15	8.11
		Total	394	33.59	33.89	33.77	6.72	7.09	6.93
Academic Effort	Arts	Undergraduate	78	27.84	27.30	27.45	5.30	4.97	5.11
		Postgraduate	52	26.74	28.39	27.79	5.57	6.78	6.36
	Human Sciences	Undergraduate	74	23.90	26.57	25.39	5.48	6.35	6.10
		Postgraduate	88	25.79	27.20	26.46	5.16	5.88	5.52
	Sciences	Undergraduate	62	24.35	28.67	27.48	5.36	6.51	6.47
		Postgraduate	40	25.56	26.25	25.98	5.66	5.88	5.73
		Total	394	25.74	27.41	26.70	5.50	6.10	5.90
Academic Achievement	Arts	Undergraduate	78	3.26	2.97	3.11	1.44	.97	1.06
		Postgraduate	52	2.87	3.86	3.34	.82	1.06	1.03
	Human Sciences	Undergraduate	74	2.58	2.84	2.74	.95	1.19	1.09
		Postgraduate	88	2.96	2.94	2.95	1.10	.86	.99
	Sciences	Undergraduate	62	2.45	3.20	3.00	.82	1.24	1.19
		Postgraduate	40	2.70	3.00	2.88	.92	1.01	.98
		Total	394	2.92	3.05	2.98	.95	1.06	1.00

N= number of participants

Table 3: Significant Multivariate effects

Variable(s)	DV	Sig	F	df	Mean Square	Partial Eta Squared (η^2)
Gender	AE	.008*	7.052	1	238.059	.018
	ACHIE	.012*	6.432	1	7.094	.017
Faculty	ACHIE	.014*	4.304	2	4.747	.022
Gender*Faculty*Level	ACHIE	.014*	4.305	2	4.747	.022

Significant at * $p < .017$, DV = Dependent Variable, AE = Academic Effort, ACHIE = Academic Achievement

Results from the individual Partial Eta Squared (η^2) revealed a small but significant effect size, that is, gender explained 1.8% in the students' academic effort, and 1.7% of the university students' academic achievement. Again the results of the Partial Eta Squared showed that the faculties in which students studied explained 2.2% of their academic achievement while it was also found that 2.2% of the variance in

students' academic achievement was explained by the interaction between gender, faculties, and levels of study for the students.

The Tukey Post Hoc Test results on the faculties of students revealed a statistically significant difference in the faculties' interaction with the students' academic achievement in the faculties of Arts and Human Sciences ($p = .008$) at ($p < .05$). Further using the Bonferroni's adjusted critical value to control type I Error inflation, several follow-up contrasts were conducted. The results indicated that males ($N = 167, M = 33.59, SD = 6.72$) were found to have no difference in academic confidence with the females ($N = 227, M = 33.89, SD = 7.09$). For academic effort, the males ($N = 167, M = 25.74, SD = 5.50$) were found on average to have a lower score than the females ($N = 227, M = 27.41, SD = 6.10$), while again the males ($N = 167, M = 2.92, SD = .95$) were found to have a lower score than the females ($N = 227, M = 3.05, SD = 1.06$) in academic achievement.

In a univariate two-way Analysis of Variance (ANOVA) done to follow-up the revealed effect of each independent variable on the dependent variables, statistically significant differences were revealed. The variables which were found to be statistically significant under the Multivariate Analysis of Variances (MANOVA) were significant when tested independently using ANOVA. Gender and academic effort ($F(1, 394) = 7.812, p = .005$), and gender and academic achievement ($F(1, 394) = 4.341, p = .038$) were significant. Faculties and academic achievement ($F(2, 394) = 4.455, p = .012$), and the interaction between gender, faculties, levels of study and academic achievement ($F(4, 389) = 3.844, p = .004$) were also found to be significant. All these were at $p < .05$.

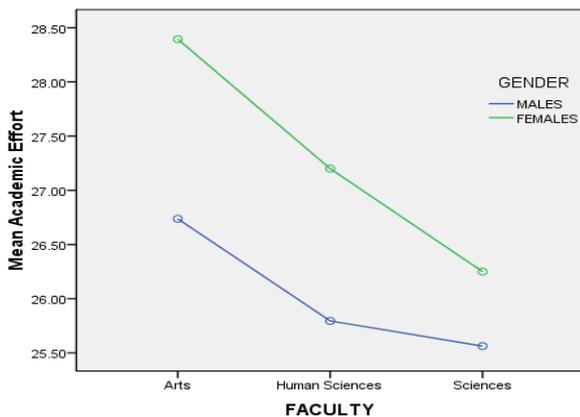


Figure 1: Graph showing the interaction between gender, faculties and academic effort among students at postgraduate level.

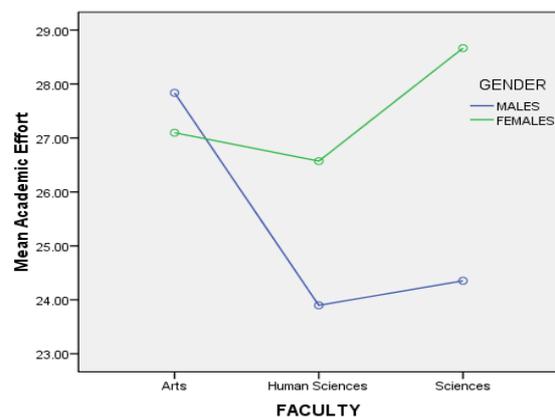


Figure 2: Graph showing the interaction between gender, faculties and academic effort among students at undergraduate level.

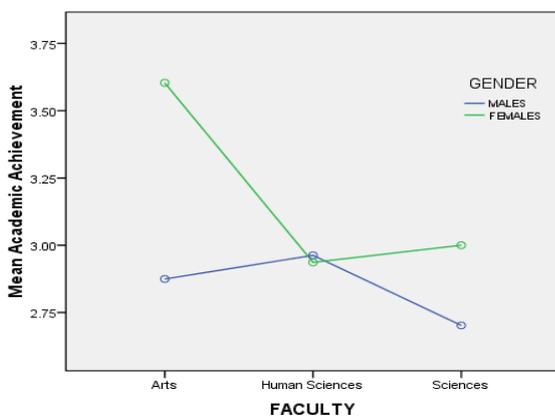


Figure 3: Graph showing the interaction between gender, faculties and academic effort among students at postgraduate level.

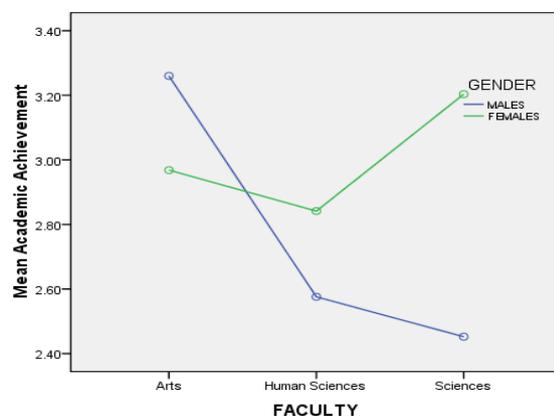


Figure 4: Graph showing the interaction between gender, faculties and academic effort among students at undergraduate level.

According to figure 1, it can be observed that female postgraduate students had higher academic effort compared to their male counterparts across all the faculties (Arts, Human Sciences, and Sciences). Again from figure 1, the effect of gender on academic effort was the same for males and females with no significant interaction. This is because both males and females had a high academic effort in the faculties of Arts, which declined for both males and females in Human Sciences faculties, and declined further in both males and females in the Science faculties. It can also be drawn from figure 1 that males had lower academic effort than females in all faculties. In figure 2 among the undergraduate students there was a significant interaction effect of gender on academic effort. A significant interaction of gender on academic effort was observed to be between the faculties of Arts and the faculties of Human Sciences. Although there was a small difference in academic effort for both males and females in the faculties of Arts, there was a big difference in the academic effort for both males and females in the faculties of Human Sciences. The biggest difference in the academic effort between males and females was noted in the faculties of Science.

In figure 3, there was a significant interaction effect of gender on academic achievement among postgraduate students in the faculties of Human Sciences. Females in the faculties of Arts and Faculties of Science had a higher academic achievement than their male counterparts, while both males and females had the same academic achievement in the Faculties of Human sciences. It can be noted among the postgraduate students that females had higher academic achievement than the males. In an observation to figure 4, the undergraduate students' gender also had a significant interaction effect on their academic achievement. There was an interaction in between gender and academic achievement in the faculties of Arts and faculties of Human Sciences. It can be observed from figure 4 that in the faculties of Arts the males had a slightly higher academic achievement compared to the females, while in the faculties of Human Sciences the females had higher academic achievement compared to their male partners. A greater difference in academic achievement was noted in the faculties of Sciences with females having a higher academic achievement compared to the males.

Discussion

In this study, the findings got have expanded on the knowledge in the area of academic self-concept and academic achievement. The results got which are significant can explain some of the related issues in students' academic achievement in relation to their academic self-concept.

According to gender differences, the results of this study reveal that there is a statistically significant difference in the academic effort and academic achievement among university students. From literature, Wigfield, et al. (2001) and Ireson, et al. (2001) findings concur with the results of this study that there is a difference in the academic self-concept of males and females, that is, males and females possessing different beliefs about their academic competencies. Also, at the same time the results disagree with the findings of a study by Kling, et al. (1999) who highlighted that the males had a higher academic self-concept than females and thus a higher academic achievement for the males compared to the females which is the reverse in this study.

Gender has been highlighted to influence academic self-concept and academic achievement in various studies done on gender, self-worth, and academic achievement among students. A significant difference in self-concept was noted between males and females and thus in their academic achievement (SarAbadaniTafreshi, 2006). In contrast to SarAbadaniTafreshi (2006) findings, Hossaini (2002) found out that gender does not influence self-concept and self concept does not influence academic achievement in any way. According to Zareh (1994) who studied the relationship between achievement of motivation, self-concept, and gender among students found out that there was a significant relationship between self-concept and gender. In another research which investigated the relationship between self-concept and academic achievement, it was discovered that high self-concept facilitates academic achievement (Pullmann & Allik, 2008).

It can again be noted that the results of this study reject the findings that there is a difference in academic self-concept and thus in the academic achievement among students according to their courses (faculties), that is, either science or non-science based courses (faculties) (Harter, 1999; Marsh, 1989).

According to the Post Hoc results, a significant difference in the faculties (courses) in relation to academic achievement was revealed in between the Arts and Human Sciences faculties which are all non science faculties. This means that the difference in between the science and non science faculties does not exist, and more so to the science and non-science courses. In line with the results of the study, they support the findings of Trautwein, et al. (2006) who suggested that academic self-concept may differ as a function of the students' achievement on their reference group. Males and female students were found to have different mean academic self-concept (academic effort) with also a different academic achievement. Academic effort is a component of academic self-concept which was found to have a significant difference among students (male and female) on their academic achievement.

It can also be noted from the results of this study that the students with higher the academic effort had high academic achievement. From the results of this study the females had a relatively higher mean score for academic effort ($N = 227$, $M = 30.65$, $SD = 6.60$) than their male counterparts ($N = 167$, $M = 29.67$, $SD = 6.11$), and in turn the females had a higher academic achievement ($N = 227$, $M = 3.05$, $SD = 1.06$) in relation to the males ($N = 167$, $M = 2.92$, $SD = .95$). This means that if students engage much effort in their studies they achieve highly academically (Martin, et al. 2004). From these results we can conclude that the higher the academic effort, the higher the students achieve academically.

Conclusion

In an analysis of the findings of this study, they have applicable implications in the teaching and learning process among university students. In the teaching and learning situation targeted on students' academic self-concept, the instructors should consider gender, and faculties of students in adjusting their instructions on teaching not the levels of study (Postgraduate or undergraduate). The findings of this study reveal that there are gender and faculty differences in academic effort and academic achievement among students in universities which do not exist in their levels of study. This means that gender and faculties of students might be influential factors on students' academic self-concept which can be reflected in their academic achievement as well. Instructors should be aware that students' academic efforts are contributors to their academic achievement. So, instructors should go an extra mile to look at the interaction between gender, faculties, and levels of study for the students in order to improve on their learning and thus their academic achievement.

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Appendix

Liu and Wang's Academic Self-Concept Scale

1= strongly Disagree, 2 = Disagree, 3 = neither agree nor disagree, 4 = Agree, 5 = Strongly Agree

1.	I can follow the lectures easily.	1	2	3	4	5
2.	I day-dream a lot in lectures.	1	2	3	4	5
3.	I am able to help my course mates in their school work.	1	2	3	4	5
4.	I often do my course work without thinking.	1	2	3	4	5
5.	If I work hard, I think I can get better grades.	1	2	3	4	5
6.	I pay attention to the lecturers during lectures.	1	2	3	4	5
7.	Most of my course mates are smarter than I am.	1	2	3	4	5
8.	I study hard for my tests.	1	2	3	4	5
9.	My lecturers feel that I am poor in my studies.	1	2	3	4	5
10.	I am usually interested in my course work.	1	2	3	4	5
11.	I often forget what I have learned.	1	2	3	4	5
12.	I will do my best to pass all the courses this semester.	1	2	3	4	5
13.	I get frightened when I am asked a question by the lecturers.	1	2	3	4	5
14.	I often feel like quitting the degree course.	1	2	3	4	5
15.	I am good in most of my courses.	1	2	3	4	5
16.	I am always waiting for the lecture to end and go home.	1	2	3	4	5
17.	I always do poorly in course works and tests.	1	2	3	4	5
18.	I do not give up easily when I am faced with a difficult question in my course work.	1	2	3	4	5
19.	I am able to do better than my friends in most courses.	1	2	3	4	5
20.	I am not willing to put in more effort in my course work.	1	2	3	4	5