

# INTERNATIONAL STUDENTS' SELF-REGULATED LEARNING AND ITS RELATION TO MATHEMATICS ACHIEVEMENT IN AN OFF-SHORE AUSTRALIAN PROGRAM

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## ABSTRACT

*The study examines any differences in the use of self-regulated learning (SRL) strategies between domestic and international students early and late in the semester, and also investigates the relation between SRL strategies and mathematics achievement. A sample consists of 32 domestic students and 38 international students who are in their first semester in an off-shore Australian pre-university program in Malaysia. The Learning and Study Strategies Inventory (LASSI) is employed to measure self-reported SRL strategies for the same sample twice during the semester. The results indicate that international students score higher in almost all LASSI subscales than domestic students at the beginning and towards the end of their semester. The results also reveal Anxiety subscale is significantly related to mathematics achievement attained early and late in the semester for domestic students. No significant relation between LASSI subscales and mathematics achievement is obtained early in the semester, while Anxiety, Concentration, Selecting Main Ideas, Time Management and Test Strategies subscales are significantly related to mathematics achievement attained late in the semester for international students.*

**Keywords:** Self-regulated learning (SRL), international students, domestic students, mathematics, Pre-university

## INTRODUCTION

The liberalization of Malaysian higher education particularly in private higher education in the 1990's was due to the 1997 East Asian financial crisis (Sivalingam, 2006) and limited places offered by public universities as a result of rising demand for higher education (Lee, 2004). But, from a positive perspective, it was the government's vision to establish the nation as a higher education hub in South-East Asia region (Morshidi, 2006). Since then private higher education in the nation has expanded rapidly. There were only 156 private institutions with 55,111 enrolments in 1992 (Marimuthu, 2008). It grew to 476 private institutions with 541,629 enrolments in 2010 (Ministry of Higher Education, 2010). International student enrolments at private higher education institutions were encouraging for the last few years with 50,679 in 2008, 58,294 in 2009, and 62,705 in 2010 (Ministry of Higher Education, 2008, 2009, 2010). 65.3% of international students at private higher education institutions came from Asian countries in 2010, while 27.1% came from African countries in the same year (Ministry of Higher Education, 2010). Offerings of many off-shore Australian education programs by local alliance partners and the creation of off-shore campuses in the nation by Australian universities such as Monash University, Curtin University, and Swinburne University occurred after the liberalization of higher education. Off-shore Australian programs offered by their local alliance partners range from pre-university to professional certification. Australian Matriculation Program (AUSMAT), South Australian Matriculation

(SAM), and Monash University Foundation Year (MUFY) are few famous pre-university programs offered here.

Substantial literature on international students has examined their choice criteria in choosing Malaysia as their destination of higher education (British Council, 2008; National Higher Education Research Institute, 2009; Jani and Zubairi, 2010; Baharun et al., 2011). For example, affordable tuition fees, international recognition of qualification, and opportunity to make international contact are the top three criteria rated by international students (Jani and Zubairi, 2010). However, details on other aspects of international students such as their learning experiences while studying in the nation and their learning styles are rare. Limited research on these aspects is about English learning and computer-based approaches to the learning (e.g. Abdullah et al., 2009; Suryani et al., 2012).

On the other hand, literature on international students at Australian institutions is ample. Most literature pertaining to academic teaching and learning of international students from Australia is reviewed in this study as an off-shore Australian education program is examined. The success of internationalization of Australian higher education is mainly imputed to the encouragement by the Australian government in various aspects such as internationalization of curricula and exportation of Australian higher education programs/services particularly to Asia Pacific region (Harman, 2005). Harman categorizes activities pertaining to internationalization of Australian higher education, and one of those activities is “export education where education services are offered on a commercial basis in other countries, with students studying either in their home countries or in the country of the provider” (p. 121), which fits the description for the Australian program surveyed in this study. As long as academic teaching and learning of international students is concerned, it traces back to the work by Biggs (1997) on whether or not domestic and Asian students adopt different learning approaches, and the work by Pearson and Beasley (1996) on teaching methodologies that are developed based on international students to be adopted in teaching for the general student population. Ramburuth and McCormick (2001) suggest that international students with Asian background use more deep motivation, surface strategies, and achieving strategies, while domestic students use more deep strategies and surface motivation at a large on-shore Australian university. Prescott and Hellstén (2005) report that on-shore international students in Australia encounter a troublesome transition experience such as “struggle and confusion”, “learning is slow and arduous”, and “emphasis on time and its effects on learning, language processing and coping ability”. Both authors’ in-depth analyses in the social and cultural aspects of learning pedagogies demonstrate a double-edged challenge (e.g. “effective” vs. “ineffective”) in the teaching and learning of general student population, and recommend a critical review of academic teaching and learning. In addition, it is reported that metacognition plays an important role in academic achievements of multicultural students (which included international students in that study) along with their academic skills at an on-shore Australian university (Strang, 2008). This article is to examine learning styles of both domestic and international students from students’ self-regulated perspective in an off-shore Australian education program as a first step towards a better understanding of international students’ learning styles. The learning styles explored in this study is described as self-regulated learning (SRL) strategies and it is widely known in academic communities of educational psychology.

## **SELF-REGULATED LEARNING (SRL)**

A close synonym to SRL is self-regulation, and the two terminologies are used interchangeably in a large number of studies (Dinsmore et al., 2008). It is absolutely helpful to define SRL at the beginning of this article to clear any confusion and puzzle over its

meaning. Zimmerman (1986) defines SRL as to what degree students are metacognitively, motivationally, and behaviorally active in their own learning process, in which three crucial elements, namely metacognition, motivation, and behaviour, are involved in one's self-regulation process of learning to attain one's academic goals. Zimmerman's work is drawn from social cognitive theory of human learning (Bandura, 1977, 1986) in which Bandura integrates self-regulation into his theory through three sub-processes of self-observation, self-judgment, and self-reaction. Later literature on SRL further describes it in broader aspects and from different perspectives. For example, Paris and Paris (2001) describe SRL as "emphasizes autonomy and control by individual who monitors, directs, and regulates actions toward goals of information acquisition, expanding expertise, and self-improvement" (p. 89). Zimmerman (2008) views SRL as "proactive processes that students use to acquire academic skills, such as setting goals, selecting and deploying strategies, and self-monitoring one's effectiveness, rather than as a reactive event that happens to students due to impersonal forces" (p. 166). Purdie et al. (1996) describe self-regulated learners as self-initiators who exercise choice control over the methods required to achieve their learning goals set for themselves.

### **Learning and Study Strategies Inventory (LASSI)**

One of popular inventories to measure the use of SRL strategies is the Learning and Study Strategies Inventory (LASSI). The 2<sup>nd</sup> Edition of LASSI (Weinstein, Palmer, and Shulte, 2002) consists of ten subscales and 8 items for each subscale, where students answer all items using a 5-point Likert scale (1 = not at all typical of me, 5 = very much typical of me). The score for each LASSI subscale is calculated by summing the scores of 8 items, following the reverse scoring for worded negatively items. Each LASSI subscale has a score ranges from 8 to 40. A higher score in each LASSI subscale indicates a student is better or positive in that construct of self-regulation. For instance, if the score of Anxiety subscale is high, it means that students have a low anxiety level.

The following are the ten subscales of the 2<sup>nd</sup> Edition of LASSI and their internal consistency international reliability coefficients (Cronbach's  $\alpha$ ):

1. Anxiety – feelings of worry towards school and tests despite being well prepared. ( $\alpha = .87$ )
2. Attitude – interest in and attitude towards school; desire to work on academic tasks. ( $\alpha = .77$ )
3. Concentration – ability to pay attention to, concentrates on, and thinks about the learning materials; will not be easily distracted. ( $\alpha = .86$ )
4. Information Processing – the use of verbal and imaginal elaboration; strategies of organizing and interrelating information; skills of comprehending, reasoning, and use of logic. ( $\alpha = .84$ )
5. Motivation – desire and willingness to work hard; level of motivation and incentive for school; self-discipline. ( $\alpha = .84$ )
6. Self-Testing – regular review of course materials; checks of the comprehension level attained; preparation for the lesson. ( $\alpha = .84$ )
7. Selecting Main Ideas – ability to figure out the critical points and key ideas in the course materials and focus on these during studying. ( $\alpha = .89$ )
8. Study Aids – good use of various aids and techniques to support learning; use of key words, examples, headings, and diagrams to help learning. ( $\alpha = .73$ )

9. Time Management – create and use schedules to manage their responsibilities effectively. ( $\alpha = .85$ )
10. Test Strategies – knowledge of different types of tests and the necessary preparation for them. ( $\alpha = .80$ )

### **SRL on Academic Achievement**

One of the early works on SRL demonstrates that high school students from a higher academic track use more SRL strategies than students from a lower academic track (Zimmerman and Martinez-Pons, 1986). A further study by Zimmerman and Martinez-Pons (1988) reveals that the use of SRL strategies among students contribute significantly to the positive outcomes for both verbal and mathematics tests apart from their general academic ability. Later research has well documented a link between the use of SRL strategies and academic achievement among general student populations (Nist et al., 1990; Hulick and Higginson, 1989; Yip and Chung, 2005; Reaser et al., 2007; Crede and Kuncel, 2008). For example, first-year college students who obtain higher scores in the LASSI subscales of Attitude, Motivation, Anxiety, Concentration, Information Processing and Test Strategies obtain better results in their grade point average (GPA) (Hulick and Higginson, 1989). Selecting Main Ideas, Attitude, Study Aids, Motivation, Time Management, Self-Testing and Test Strategies subscales are the significant predictors for matriculation students' mean GPA, and Concentration and Motivation subscales are the significant predictors for university students' mean GPA (Yip and Chung, 2005). However, very limited research has examined the link between the two, academic achievement and the use of SRL, among international students. One study demonstrates that international students' GPA is significantly correlated with Motivation, Self-Testing and Test Strategies (Stoynoff, 1997).

Empirical studies have also shown the importance of the use of SRL strategies on mathematics achievement among general student populations. SRL strategies, which consist of awareness, self-checking, cognitive strategy use and effort, are correlated to mathematics achievement of high school students who are mathematically gifted (Malpass et al., 1999).

The grade of an online mathematics course for college students is significantly predicted by Motivation, Concentration, Information Processing and Self-Testing subscales (Wadsworth et al., 2007). The use of SRL is significantly correlated to average grade in science subjects (i.e., physics, chemistry, biology and mathematics) among eighth grade students (Eilam et al., 2009). However, in these previous studies the use of SRL strategies is measured at a point of time over their academic term. The emphasis of the use of SRL strategies may be varied at different time points of academic term at an educational level and have different influences on academic achievement. No differences in anxiety, self-concept, or self-efficacy for self-regulation between beginning and end of year among sixth graders (Pajares and Graham, 1999). Students in three different GPA groups are significantly different in Selecting Main Ideas and Motivation subscales over the three years of undergraduate study (Downing, 2009).

The grade of a test of geometry course achieved early in the semester among high school students is significantly predicted by metacognition strategies and effect management, while the grade of another test obtained late in the semester was significantly predicted by metacognition strategies (Pokay and Blumenfeld, 1990). First-year college students' GPA is significantly predicted by time and study environment and self-efficacy, and third-year college students' GPA is significantly predicted by time and study environment (Kitsantas, 2002).

## OBJECTIVES OF THE STUDY

This study seeks to examine any differences in SRL strategies between domestic and international students in an off-shore Australian pre-university program in Malaysia at the beginning and towards the end of their first semester. It follows by evaluating the relation between the use of SRL strategies and mathematics achievement. This study provides insight into students' self-regulation process to attain their mathematics outcome.

## METHODOLOGY

### Participants

Seventy first-semester students (37 males and 33 females) in an off-shore Australian pre-university program at a private college voluntarily participated in the study. Of this total, 32 were home students (16 males and 16 females) and 38 were international students (21 males and 17 females). All came from four classes of a mathematical subject during January 2012 semester, and they were taught by the same instructor.

### Variables and Material

There were two parts in the survey material. The first part consisted of demographic questions such as name, gender, age and nationality. The second part consisted of the 2<sup>nd</sup> Edition of LASSI (Weinstein, Palmer and Shulte, 2002), which was employed to measure self-reported SRL strategies of students.

Two assessments during the semester, namely Test 1 and Final Exam, were used to evaluate the students' mathematics achievement. The content of Test 1 covered the first two topics of the subject: numbers, operations with number, ratio and proportion, and the content of Final Exam included all topics: number, operations with numbers, ratio, proportion, algebra, sequence, series, and business mathematics. Both assessments consisted of all subjective questions. The scores of the two assessments were converted, and the scores were ranged from 0 to 100.

### Procedure

The survey involved first-semester students, and it was conducted in the classes of a mathematical subject where the medium of instruction is English. During the 2<sup>nd</sup> week of the semester, first-semester students were identified through student list downloaded from the attendance monitoring system. These students were briefed on the purpose of the study, and they were then administered the survey material. These students were asked to fill in the questionnaire and returned it to their instructor in the class. During the 4<sup>th</sup> week of the semester, students were evaluated by Test 1 after finishing the first two topics.

The same survey material was given during the 13<sup>th</sup> week of the semester to the same group of students. This time, they were asked to write down their name only in the first part and to answer all items in the second part. The students were asked to answer and return it in the class. At the end of semester, students were assessed by Final Exam. The final examination was two weeks away from the week they filled in the survey material for the 2<sup>nd</sup> time.

### Description of Analyses

Raw data from survey materials as well as their scores of Test 1 and Final Exam were entered into a spread-sheet of SPSS version 19. The score of each LASSI subscale was calculated based on 8 items responded by students in the inventory.

The analysis started with descriptive statistics for variables such as age, gender, nationality, student group, geographical regions, and LASSI subscales. The reliability coefficients (Cronbach's  $\alpha$ ) of LASSI subscales measured early and late in the semester were calculated. Analysis of Variance (ANOVA) was used to examine any significant difference between domestic and international students in each of LASSI subscales at two different time points in their first semester (early and late in the semester). Pearson product-moment correlation was used to measure the relation between SRL strategies and mathematics achievement attained early and late in the semesters.

## RESULTS

### Descriptive Statistics

Home students ranged in age from 16 to 22 with  $M = 18.06$  and  $SD = 1.134$ , whereas international students' age was ranged from 16 to 24 with  $M = 18.92$  and  $SD = 1.964$ . The presented international students were came from 18 countries, namely Bahrain, Bangladesh, China, Jordan, Germany, Japan, Kazakhstan, Maldives, Nigeria, Oman, Pakistan, Saudi Arabia, Singapore, South Korea, Sri Lanka, Sudan, Uganda, and Zimbabwe. Majority of international students were from Asian and African countries as provided in Table 1. This, to a certain extent, matches the international student population at private institutions of higher education in the nation (see Ministry of Higher Education, 2010).

**Table 1. Grouping of international students according to geographical regions**

<i>Geographical Region</i>	<i>Frequency</i>	<i>Percentage</i>
South Asia	13	34.3
Middle East	11	28.9
Asia Pacific	6	15.8
Africa	6	15.8
Central Asia	1	2.6
Europe	1	2.6
Total	38	100

### SRL Strategies between Domestic and International Students

All the LASSI subscales reported early in the semester had an accepted level of reliability (greater than .70) except Attitude, which can be seen in Table 2. In general, international students scored higher point than domestic students in all subscales except Information Processing. Analysis of Variance indicated that international students scored significantly higher than domestic students in the subscales of Concentration, Selecting Main Ideas and Test Strategies at the beginning of their first semester. Study Aids reported late in the semester was the only subscale had an unaccepted level of reliability as shown in Table 3. Almost the same pattern was observed late in the semester with all subscales of international students having higher score than those of domestic students. International students had significantly higher scores in Concentration and Selecting Main Ideas subscales than domestic students.

**Table 2. Descriptive statistics and comparisons between domestic and international students in SRL strategies measured early in the semester**

<i>Subscale</i>	<i>Cronbach's <math>\alpha</math></i>	<i>Student</i>	<i>Min.-max.</i>	<i>M</i>	<i>SD</i>	<i>F test</i>	<i>p-value</i>
ANX	.838	Domestic	12-33	21.38	4.92	3.821	.055
		International	9-36	24.53	7.39		
ATT	.690	Domestic	20-40	28.90	4.54	1.870	.176
		International	21-40	30.53	4.88		
CON	.805	Domestic	15-40	25.45	4.81	5.448	.023*
		International	14-40	28.56	5.64		
INP	.796	Domestic	18-40	28.21	4.61	.187	.667
		International	12-40	27.62	5.98		
MOT	.882	Domestic	18-40	27.72	4.68	1.617	.208
		International	14-40	29.74	7.33		
SFT	.860	Domestic	12-40	24.69	5.61	.229	.634
		International	10-40	25.47	7.09		
SMI	.878	Domestic	13-40	25.48	5.38	5.781	.019*
		International	15-39	28.88	5.77		
STA	.720	Domestic	17-40	25.59	4.89	.017	.896
		International	18-40	25.76	5.78		
TMT	.775	Domestic	18-40	26.00	4.34	2.096	.153
		International	16-39	27.91	5.87		
TST	.717	Domestic	16-40	25.55	4.51	5.203	.026*
		International	17-36	28.18	4.59		

Note: ANX = Anxiety; ATT = Attitude; CON = Concentration; INP = Information Processing; MOT = Motivation; SFT = Self-Testing; SMI = Selecting Main Ideas; STA = Study Aids; TMT = Time Management; TST = Test Strategies. \* Significant difference at the .05 level.

**Table 3. Descriptive statistics and comparisons between domestic and international students in SRL strategies measured late in the semester**

<i>Subscale</i>	<i>Cronbach's <math>\alpha</math></i>	<i>Students</i>	<i>Min.-max.</i>	<i>M</i>	<i>SD</i>	<i>F test</i>	<i>p-value</i>
ANX	.882	Domestic	9-30	19.29	6.14	3.794	.056
		International	8-37	22.70	7.71		
ATT	.703	Domestic	16-35	27.16	4.05	2.831	.097
		International	20-40	29.18	5.41		
CON	.867	Domestic	10-32	22.39	5.08	5.650	.021*
		International	8-40	25.94	6.70		
INP	.852	Domestic	17-34	27.55	5.00	.565	.455
		International	12-40	28.64	6.44		
MOT	.838	Domestic	14-37	27.48	5.34	.330	.568
		International	17-40	28.30	6.01		
SFT	.802	Domestic	14-29	22.68	4.09	2.315	.133
		International	11-39	24.67	6.11		
SMI	.890	Domestic	11-33	24.10	5.59	5.141	.027*
		International	11-40	27.48	6.32		
STA	.617	Domestic	17-31	24.48	3.86	.349	.557
		International	15-35	25.18	5.40		
TMT	.712	Domestic	16-30	23.77	4.30	2.819	.098
		International	12-37	25.88	5.59		
TST	.737	Domestic	14-34	24.29	4.80	1.047	.310
		International	8-40	25.61	5.44		

Note: \* Significant difference at the .05 level.

### Relation between SRL Strategies and Mathematics Assessments

As shown in Table 4, the score of Test 1 was significantly and positively correlated with Anxiety subscale for domestic students, which means that a higher score in Test 1 is associated with a lower anxiety level. The score of Test 1 for international students was not significantly correlated with any of the LASSI subscales. The score of Final Exam was significantly and positively correlated with Anxiety subscale for domestic students, and the score of Final Exam for international students was significantly and positively correlated with



five LASSI subscales, namely Anxiety, Concentration, Selecting Main Ideas, Time Management, and Test Strategies.

**Table 4. Bivariate correlations between mathematics assessments and SRL strategies for home and international students**

<i>Subscale</i>	<i>Domestic students</i>		<i>International students</i>	
	<i>Test 1</i>	<i>Final Exam</i>	<i>Test 1</i>	<i>Final Exam</i>
ANX	.427*	.364*	-.213	.492**
ATT	-.066	.054	-.149	.334
CON	.067	.297	-.019	.376*
INP	.100	-.008	.040	.288
MOT	-.071	-.037	.114	.332
SFT	.018	.218	.279	.243
SMI	.074	.117	.090	.508**
STA	-.053	-.046	.109	.330
TMT	.049	.088	-.050	.355*
TST	.277	.260	-.159	.534**

Note: \* Correlation is significant at the .05 level; \*\* Correlation is significant at the .01 level.

## DISCUSSION

International students are able to use more SRL strategies than domestic students at the beginning and towards the end of their first semester. The result is very surprising as domestic students who are more familiar with local learning environment such as accent and teaching approaches are unable to exercise more SRL strategies than their international counterparts. It also shows that international students in this cohort have a higher degree of directing and monitoring their own academic learning than domestic classmates. This is a contrast to the finding by Prescott and Hellstén (2005) that international students face many difficulties while studying at an on-shore Australian university such as “learning is slow and arduous” and “emphasis on time and its effects on learning, language processing and coping ability”. Their analyses are based on social and cultural experiences of on-shore international student group (or experiences of “other”) in “western” learning environment or setting, which is quite a contrast to this study where majority of foreign students come from Asian and African countries and study in an off-shore Australian program in an Asian country. Social and cultural clashes between foreign students (who are mostly Asians and Africans) and Malaysian learning environment may be different from those of Prescott and Hellstén’s (2005) study. This triggers a further study to be carried out to look into how social and cultural differences and/or similarities between international students who come from one cultural group and new learning environment in an off-shore education program may influence students’ use of SRL strategies. Cross-cultural studies in the use of SRL strategies provide clues to the issue highlighted here. For example, Olaussen and Bråten (1999)

conclude that Norwegian college students and American norming sample are considerably similar in most subscales of LASSI apart from Motivation and Attitude. While Purdie and colleagues (1996) report that Australian and Japanese students are different in 10 out of 14 reported SRL strategies such as goal setting and planning, seeking information, and keeping records.

It also draws an attention that there are other factors that influence the use of SRL strategies of students in mathematics classes. One of possible aspects is students' academic ability prior to entering the education program may play a crucial role in this case as this is reported by Zimmerman and Martinez-Pons (1986) that students with higher academic ability use more SRL strategies from students with lower academic ability. However, it is difficult to examine how this aspect of student factor may influence the use of SRL strategies as students completed different educational backgrounds. Domestic students mostly completed Sijil Pelajaran Malaysia (SPM) or the Malaysian Certificate of Education, while international students completed secondary education systems/examinations which were widely diversified in the pre-university program as reported by Tang (2012). In addition, there is no proper standardized mathematics test that puts in place to assess students' mathematics ability prior to join the program.

Among SRL strategies, only Anxiety subscale is significantly related to mathematics achievement for domestic students at the beginning of their first semester. These relations between SRL strategies and mathematics achievement remain the same towards the end of semester. The positive relation between Anxiety subscale and mathematics performance resembles the results by Hulick and Higginson (1989) and Crede and Kuncel (2008). It shows a negative influence of feeling of anxiety towards school and tests on academic performance is a common phenomenon, and it needs to be taken seriously by teachers. This relation also resembles a negative effect of mathematics anxiety on mathematics performance which is widely reported (e.g. Legg and Locker, 2009; Tang, 2012). The construct of anxiety in the self-regulation process generally refers to overall feeling of worry towards academic matters and schools, while mathematics anxiety is specifically referred to feelings of tension in solving mathematical problems such as manipulation of numbers and word problems (see Richardson and Suinn (1972) for the definition of mathematics anxiety). All these can be summarized that students could improve their mathematics performance with the decrease in feelings of worry towards school learning environment and academic matters particularly related to mathematics.

On the other hand, the pattern of the relations between SRL strategies and mathematics achievement is totally different from that of domestic counterparts. Although international students are able to exercise more SRL strategies than domestic students at the beginning of their first semester, no relations between SRL and mathematics performance is found. It is quite clear that a higher degree involved in self-regulation process does not guarantee a positive outcome in mathematics performance among international students as they are new to foreign learning environment. However, international students are able to establish a productive coherence between increasing use of SRL strategies and positive mathematics outcome late in their first semester, where they are more familiar and comfortable with new learning environment or setting late in the semester than when they are at beginning of the semester. High score in each of subscales of Anxiety, Concentration, Selecting Main Ideas, Time Management and Test Strategies for international students is significantly correlated with better mathematics performance late in the semester. This result resembles some of research studies on general student body (e.g. Hulick and Higginson, 1989; Yip and Chung, 2005) that the use of SRL contributes to overall academic performance which is mostly

measured by GPA, and it also involves more SRL strategies in the relation to mathematics achievement than that of Stoynoff's (1997) study on international students. It reflects that the use of SRL strategies is still relevant to mathematics achievement of international students once they are in more comfortable state of learning.

Few implications can be drawn from this study. The teaching methods which are developed based on international students to be applied on general student body as pointed by Pearson and Beasley (1996) could be used in the classes of the mathematical subject. By following this idea, teachers for this subject should find a way to reduce feeling of worry towards school and solving mathematical problems, to engage students in concentration, time management, test-taking skills, and to foster skills of selecting main points from study materials. All these changes will translate into a positive outcome of students' mathematics grade. Another thing is an intervention program to be carried out to enhance students' SRL strategies as such an intervention produced encouraging outcome in mathematics achievement in many studies if students are given a chance to self-regulate their learning and are taught SRL strategies (e.g. Camahalan, 2006).

## CONCLUSION

Researching into international students' learning styles in Malaysia such as SRL strategies is important apart from their choice criteria in selecting the country as their destination of higher education. The use of SRL strategies as the process that learners regulate and monitor their own learning to achieve their academic goals plays a crucial role in the learning of mathematics in an off-shore Australian program not only for domestic students who are in their first semester but also for international counterparts. The result extends our understanding from the use of SRL strategies on overall academic achievement and mathematics performance of general student body to the use of SRL strategies on mathematics performance of foreign students. The use of SRL strategies provides a means to help both domestic and international students in their learning of mathematics in their turbulent first semester. By engaging students in the use of certain SRL strategies at the beginning and towards the end of their first semester, it will produce encouraging results for this mathematical subject during this troubling transition period at private higher education institutions.

International students in this cohort use more SRL strategies than domestic students throughout their first semester. Although few possible explanations are provided in the discussion, the true answer for the phenomenon observed here can only be confirmed in the future as more studies in this aspect to be carried out in off-shore programs in the country.

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