INCREASED MASTERY OF LEARNING STRATEGIES THROUGH STRATEGY INSTRUCTION AND ATTRIBUTION RETRAINING[1]

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Abstract. The study examines students' mastery in learning strategies as effected by the strategy instruction and attribution retraining. Hundred and thirty-three students from one specifically chosen school took part in this study. They formed four randomly chosen groups, each received different treatments, namely the strategy instruction and attribution retraining, strategy instruction only, attribution retraining only, and the non-treatment. It was found that there was a significant main effect of groups [$F(3,87)=4.57$, $p=.005$, $\eta^2=.14$] mean learning strategy scores after the treatments. Significant interaction effect of groups by levels of achievement by genders by ethnicity [$F(2,87)=3.07$, $p=.052$, $\eta^2=.07$] was also found. Discussions and implications of the study are also reported.

Key words: Learning strategies, strategy instruction, attribution retraining

Abstrak. Kajian ini menyelidik penguasaan kemahiran belajar di kalangan pelajar sebagaimana dipengaruhi oleh pengajaran strategi dan latihan semula atribusi. Seratus tiga puluh tiga orang pelajar dari sebuah sekolah terpilih mengambil bahagian dalam kajian ini. Pelajar-pelajar ini membentuk empat kumpulan persampelan rawak yang masing-masing menerima pengajaran strategi dan latihan semula atribusi, pengajaran strategi sahaja, latihan semula atribusi sahaja, dan tiada rawatan. Terdapat kesan utama kumpulan [$F(3,87)=4.57$, $p=.005$, $\eta^2=.14$] dalam min kemahiran belajar selepas rawatan. Terdapat juga kesan interaksi kumpulan dengan tahap pencapaian, jantina, dan kumpulan etnik [$F(2,87)=3.07$, $p=.052$, $\eta^2=.07$]. Perbincangan dan implikasi kajian dilaporkan bersama.

Kata kunci: Pengajaran Strategi, latihan semula atribusi

1.0 INTRODUCTION

Strategies are the individuals' approaches to tasks and reflect the way they think and act when planning, executing and evaluating performance on tasks and the outcomes

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(Deshler & Lenz, 1989). These are the techniques of learning (Pintrich & Garcia, 1991; Ainley, 1993; Bembenutty & Karabenick, 1998).

Research has also shown that students vary considerably in the learning strategies they use. The more students know the effective learning strategies, the greater their metacognitive awareness, and possibly the higher their classroom achievement (Baker, 1989; Peterson, 1988).

However, with each transition to a higher educational level, teachers' expectations of students' learning and performance increase accordingly. At each successive level, students are required to learn more information and to process them in a more sophisticated manner. Thus, simple learning strategies that students develop at primary school level become less effective as they move on the higher levels. Since student often have little knowledge of how they can best study and learn, they may face difficulties in learning to master the content taught (O'Sullivan & Joy, 1990). In fact, students need to know the subject or content of what they read and learn, and it is recognised that there are skills that need to be acquired by them. Therefore, it is time for student s to reach out and master different learning strategies, so that learning can be fun.

2.0   PURPOSE OF THE STUDY

The purpose of this study was to examine the effects of strategy instruction in relation to the use of different learning strategies and attribution retraining on students' mastery of learning strategies. According to Borkowski, Carr, Rellinger, and Pressley (1990), contemporary psychological research has yielded three important findings in relation to students' learning. First, students must be strategic and engaged in strategies that build the connection between the new and the oil information, second, students must possess and utilise metacognitive abilities to control their thinking, and the third is, students must believe that they are responsible for their learning (Seifert & Wheeler, 1994).

The teories of learning strategies include cognitive strategies and metacognitive strategies. Cognitive strategies include the process of information gathering through selecting, understanding, remembering, relating, restoring, and retrieving whilst the metacognitive strategies deal with "learning to learn" which involves cheching, monitoring, planning, predicting, and problem-solving (Brown, 1987)

3.0   METHODOLOGY

3.1   Research Design

The design of this study was the Non-equivalent Control Group Design (Campbell and Stanley, 1963). As such, the experimental groups and the control group did not have sampling equivalence prior to the experiment. They were all intact groups existing

in different classrooms. All the four groups. The three experimental groups either received treatments of strategy instruction and attribution retraining, the strategy instruction only, or the attribution retraining only. The only control group did not receive any treatment. Pretests and posttests were administered to all the four groups.

(First Experimental)	O_1	X_1	O_2
(Second Experimental)	O_3	X_2	O_4
(Third Experimental)	O_5	X_3	O_6
(Control)	O_7	–	O_8

Note: O_1, O_3, O_5, O_7 – pretest
        O_2, O_4, O_6, O_8 – posttest
        X_1 – combined strategy instruction and attribution retraining
        X_2 – strategy instruction only
        X_3 – attribution retraining only

Figure 1   Research design

3.2   Subjects

One secondary school was specifically chosen for the study. Upon that, four classes were chosen from a total of seven Form One classes by using the randomised cluster sampling method. A total of 133 students took part in the study.

3.3   Instruments

(i)   Learning Strategies Scale

The Learning Strategies Scale (LSS) was translated and adapted from the original scale called Learning and Study Strategies Inventory-High School (LASSI-HS) by Weinstein and Palmer (1990). LSS consisted of 36 items, testing the subjects on the same dimensions as the LASSI-HS. The dimensions were 'attitude', 'motivation', 'time management', 'anxiety', 'concentration', 'information processing', 'selecting main idea', 'study aids', 'self-testing', and 'test strategies'. It had the same structure and format of answering as the LASSI-HS. The reliability coefficients for pretest and posttest of LSS were both .84.

(ii)   Strategy-Based Attribution Retraining Programme

The Strategy-based Attribution Retraining Programme comprises ten activities whereby three activities were adopted partly from Scannell and Newstrom (1994). These activities were arranged in such a way that the students were trained on the cognitive strategies and the resource management strategies followed by the metacognitive strategies. The cognitive strategies includes concentration, selection, rehearsal, and retrieval; while

resource management strategies include time management. The metacognitive strategies include finding relationship and problem-solving.

3.4   Outcome Measures

The results were measured in terms of mean learning strategy scores after the treatment on groups, levels of achievement (high and low achiever), genders (male and female), and ethnicity (Malay and Chinese).

4.0   PROCEDURE

4.1   Strategy Instruction and Attribution Retraining Group

In the strategy instruction and attribution retraining group (n=33), learning strategies were discussed prior to each activity. While the activities were on, the researcher constantly provided attribution retraining feedbacks by emphasising on the importance of learning strategies and effort to overcome failures, such as, "Very often, people fail in carrying out the tasks because they do not have the right strategies to perform them" and, "Very often, people fail in carrying out the tasks because they do not put in enough effort to perform them".

4.2   Strategy Instruction Only Group

In the strategy instruction only group (n=34), the aim was only to discuss the learning strategies with the subjects. The major difference was on the feedbacks from the researcher. No attribution retraining feedbacks were provided apart from the usual feedbacks like, "That's right." and "OK!".

4.3   Attribution Retraining Only Group

In the attribution retraining group (n=33), activities were carried out without discussing any of the learning strategies with the subjects, but with the aim of re-attributing subjects' attributions for success and failure. Feedbacks from the researcher played vital roles. Prior to the activities, the researcher initiated the subjects by saying, "Why do you think people always fail?", "People always fail because they do not put in enough effort to perform the tasks." While the activities were ongoing, the researcher constantly provided feedbacks by emphasising on the importance of effort to overcome failure.

4.4   Non-Treatment Control Group

The non-treatment control group (n=33) attended the lessons in a normal classroom environment. Subjects from this group did not receive any of the three treatments mentioned earlier.

5.0 RESULTS

5.1 Mean Learning Strategy Scores After the Treatment

The analysis on mean learning strategy scores was conducted by using the Univariate Analysis of Covariance. There was significant difference among the groups [$F(3,87)=4.57$, $p=.005$, $\eta^2=.14$] on mean learning strategy scores after the treatment. The result also indicated that the groups had interacted with levels of achievement, genders and ethnicity that gave rise to significant difference on mean learning strategy scores after the treatment [$F(2,87)=3.07$, $p=.052$, $\eta^2=.07$].

Table 1   Univariate analysis of covariance on mean learning strategy scores after the treatment for groups, levels of achievement, genders, and ethnicity

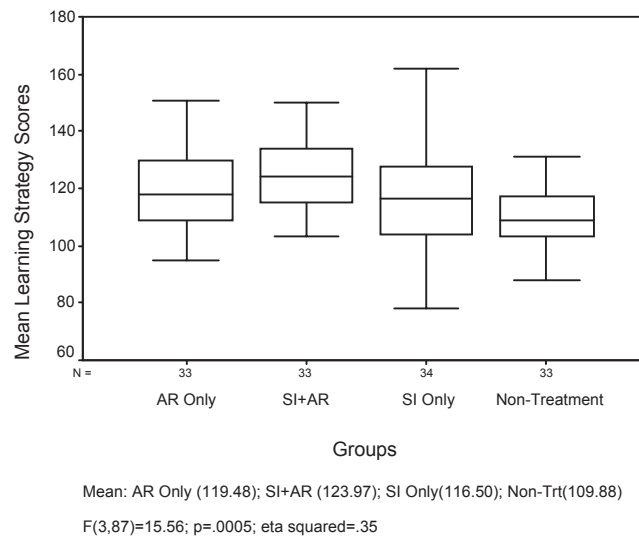| Source of Variation	SS	Df	MS	F	p
Main Effect:					
Group	1340.86	3	446.95	4.57	**.005***
Level of achievement	187.63	1	187.63	1.92	.170
Gender	168.14	1	168.14	1.72	.193
Ethnicity	263.51	1	263.51	2.69	.104
Interaction Effect:					
Group * Level of achievement*	600.68	2	300.34	3.07	**.052***
Gender * Ethnicity					
Residual Error	8514.38	87	97.87		
Total	1712405.00	120			

*. Significance at p<.05

In order to ascertain which group has significant higher score on mean learning strategy scores after the treatment, Post Hoc Comparisons using Bonferroni Test was used. Table 2 indicated that the mean learning strategy scores in the strategy instruction and attribution retraining group (MD=14.09, p=.0005) and in the attribution retraining only group (MD=9.61, p=.036) were significantly higher than that in the non-treatment control group.

Overall, the strategy instruction and attribution retraining group showed the highest mean learning strategy scores after the treatment (M=123.97) (*see* Figure 2). The horizontal line in the middle of the box indicated that the score distribution for the strategy instruction and attribution retraining group was the most normal among other groups. Judging from the position of the middle line, it was shown that the median value for this group too, was the highest. The scores in the strategy instruction only group were more varied, as indicated by a taller box.

Table 2   Bonferroni test of mean learning strategy scores after the treatment for different groups

(I)Group	(J)Group	Learning Strategy	
		Mean Difference (I − J)	p
SI + AR	SI Only	7.47	.182
	AR Only	4.48	1.000
	Non-Treatment	14.09	**.0005***
SI Only	AR Only	–2.98	1.000
	Non-Treatment	6.62	.327
AR Only	Non-Treatment	9.61	**.036***
Non-Treatment	AR Only	–9.61	**.036***
	SI + AR	–14.09	**.0005***
	SI Only	–6.62	.327

* The mean difference is significant at the .05 level

Mean: AR Only (119.48); SI+AR (123.97); SI Only(116.50); Non-Trt(109.88)

F(3,87)=15.56; p=.0005; eta squared=.35

Figure 2   Box-Plot of mean learning strategy scores after the treatment for different groups

6.0   DISCUSSIONS

Both the mean learning strategy scores after treatment in the strategy instruction and attribution retraining group and in the attribution retraining only group were significantly higher than that of the non-treatment control group. This shows that the combined

treatment had successfully driven the subjects to employ the learned strategies and had created the durable effect of strategy use among the subjects. Subjects who received the attribution retraining only treatment might be employing diligently the less effective learning strategies while in elementary school. Hence, they still performed better than subjects who did not receive any treatment.

The mean learning strategy scores in the strategy instruction only group however, did not differ significantly from that of the non-treatment control group. Again, this is probably due to lack of full awareness of strategy use among the subjects . Tompkins (1991) found that many students do not transfer the strategy learned from guided practice to independent practice. According to Garner (1990), students rely on the less sophisticated strategies like rehearsal although they may have other strategies. They are more dependent on the less sophisticated strategies because these strategies had been successful for them in the past. They are less familiar with the sophisticated strategies like self-testing and problem solving, so they are less likely to employ them. A possible explanation is that many students are not aware that the current strategies employed by them are less effective than the new strategies that were taught to them. Therefore, they have not been motivated to follow these strategies after the instruction (Van Overwalle & De Metsenaere, 1990). Also, the non-significant difference is probably due to the absence of attribution retraining which serves as an important tool to motivate the students from time to time.

On the other hand, the mean learning strategy scores in the strategy instruction and attribution retraining group did not differ significantly from those in the attribution retraining only group and in the strategy instruction only group. The mean learning strategy scores in the strategy instruction only group did not differ significantly from that in the attribution retraining only group either. The lack of significant difference in the mean learning strategy scores can probably be due to the fact that subjects from the strategy instruction and attribution retraining group had undergone the same strategy instruction with the strategy instruction only group. For subjects from the attribution retraining only group, although they were not exposed to any learning strategies, they were told to put in effort in order to succeed. Thus, one cannot deny that subjects from the attribution retraining only group were in fact trying very hard to employ their own strategies in order to succeed. According to Borkowski *et al.* (1986), children's motivational belief can interfere with their strategic behaviour. Children who believe failure is due to lack of effort are likely to engage more in strategic behaviour.

However, the overall result showed that the strategy instruction and attribution retraining group obtained the highest mean learning strategy scores after the treatment as compared to those from the other three groups.

7.0 IMPLICATIONS

This study had demonstrated that students who had undergone the combined strategy instruction and attribution retraining had shown a higher mastery of learning strategies

as compared to either the strategy instruction only, attribution retraining only, or the normal classroom learning.

From the study, the combined strategy instruction and attribution retraining had been effective as compared to the normal classroom learning. Hence, teachers are encouraged to practice using both the strategy instruction and attribution retraining in the normal classroom learning.

The study further proposed that learning strategies discussed during the strategy instruction be used as 'tools' for the students when they are faced with difficulties whilst the attribution retraining feedbacks be used as a 'motivator' to them.

8.0 CONCLUSION

In conclusion, it is imperative for educators to teach students how to learn and at the same time to provide them with attribution retraining feedbacks. Only then can students' learning maximised.

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