Ekoloji 28(108): 523-527 (2019)

LETTER TO THE EDITOR

# Martial Arts Auxiliary Training Method Based on Ecological Science

Xinke Leng[1,2], Huijun Jiang[3], Guobin Dai[1*]

[1]School of Martial Arts, Shanghai University of Sport, Shanghai 200438, China

[2]Physical Education Institute, Hunan University, Changsha 410028, China

[3]Physical Education Institute, Hunan First Normal University, Changsha 410205, China

[*]Email: daiguobin@sus.edu.cn

Auxiliary training method of martial arts based on Ecological Science is proposed in this paper, which takes a university martial arts student as the research object, it takes the cognitive training method, metacognitive strategy and image training method to carry on the experiment analysis to the martial cadets. The results show that the cognitive training method can give full play to the cognitive function of the students, deepen the students' understanding of technology, and speed up the mastery of action techniques. After the use of metacognitive strategies, the students with high metacognition ability and low metacognitive ability are used in the study. The performance of the staff is relatively low, the high metacognition level has a greater impact on the performance than the low cognitive level, the imagery training method is beneficial to alleviate the cognitive anxiety and enhance the state of self-confidence.

## I Introduction

Lei Ying in "New Ecology: Chinese Traditional Martial Arts Culture Protection and Carry Forward Game Analysis Ekoloji", 2019, Issue 107, Pages: 2773-2778, Article No: e107309 article mentioned (Ying 2019):

The paper makes specific analysis of Chinese martial arts culture status, by studying Chinese recent years' martial artists amount change and martial artists gender proportions, utilizing numerical analysis and data handling methods, and then finds out that present Chinese martial artists are decreasing by year, it should lay emphasis on cultivating martial artists of more high technology and high quality.

The relationship between the psychology and the body of the high level movement such as martial arts is an important issue of the attention of the sports psychology. The explanation of the high level competitive performance in the present theory involves attention, confidence, motivation, arousal and fluency. The researchers in China use the EEG technology to evaluate the athletes' psychological skills and training, training state, and central fatigue in order to provide support for improving the performance of martial art (Storzbach et al. 2017). This paper uses cognitive training method, metacognitive strategy and imagery training method selected by neuroscience to assist martial art training.

## II Method

In the course of teaching, the teacher will mess up the sequence of the technical pictures of the martial arts, and

then ask the students to rearrange the pictures in the correct order of technology (Chen et al. 2017). This helps students consolidate their understanding of technology and deepen their technical impression in mind.

According to the teaching plan, it will assign the content to each class, highlight the difficulty of the technical action, make the action links and essentials into the formula, and present it to the students in the form of board books to help the students to reflect the second conditions and improve the skill of the movement (Zhang 2019). The teaching method of the control group was based on the conventional teacher's explanation and demonstration, and the students mastered the technique through imitation and practice (Rocco et al. 2015).

This study mainly adopts the empirical method of experimental training, combining with the methods of literature, experiment, investigation (expert interview, questionnaire survey) and theoretical analysis. The participants were randomly divided into experimental group and control group. Participants in the experimental group received metacognitive training and monitored by metacognitive training problem tables. The students in the control group were taught according to the conventional teaching method.

Imagery training method

Before and after the experiment, the experts were invited to evaluate the skill level of the tested students. The criteria included the action quality, such as consistency, stability, accuracy, integrity and effectiveness, as well as the psychological performance of action strength, speed, rhythm, sequence and flexibility, sensitivity and so on. The quality of movement and performance were graded by 10 points (Qiu et al. 2015).

**III Results**

The height of the students in the experimental group and the control group were 1.71±0.21 and 1.72±0.38 respectively before the experiment. The results were 1.78±0.37 and 1.72 + 0.16 after the experiment; The weight before the experiment were 63.21±2.30 and 65.43±3.14 and the weight after the experiment were 64.93±2.73 and 67.12±2.26. The heart rate before the experiment was 59.21±5.23 and 57.36±7.23, the heart rate were 55.87±6.41 and 55.72±6.35 after the experiment. The 100m before the experiment were 12.65±0.43 and 12.47±0.78. After the experiment, the 100m were 12.69±0.56 and 12.67±0.41. It can be seen that there is no significant difference between the experimental group and the control group. Therefore, it can be considered that the contrast of the teaching experiment is based on the same condition (Han 2018).

After the application of cognitive training method, the action quality and performance quality have been changed obviously in the test and performance quality before and after the experiment. The difference is very significant ($P<0.01$). Although the control group was also changed in the action management and performance level, the difference of the change of action quality reached a significant level ($P<0.05$), and the difference of performance quality was not obvious before and after the experiment ($P>0.05$). There are significant differences between the experimental group and the control group in both the degree of mastery of skills and the formation of martial art skills. Because of the same basic conditions such as body shape and physical quality before and after the experiment, there are only differences in the selection of teaching methods and means the main reason for the difference of the results after the experiment is that the degree of mastering the operation knowledge of martial art technology is different. Although it is composed of a series of arbitrary movements of skeletal muscles, it is closely related to the methods, principles and rules of action, that is, the so-called operational knowledge. Through cognitive training, the students of the experimental group have a clearer understanding and understanding of the direction, strength, speed, order and rhythm of the martial arts movement technology movement, thus accelerating the mastery of the movement and the improvement of the performance. Cognitive training can help trainees to clearly identify training objects and training methods.

After the metacognitive training of the experimental group, the differences of metacognition between the

experimental group and the control group were compared. The students of the two classes were retested by metacognition, and the T test results of the metacognitive difference before and after the two groups

There was a significant difference in metacognitive level between the experimental group and the control group after the metacognition training and the eight weeks of teaching and training in the experimental group ($P<0.01$). There are two possible reasons for this situation: one is that metacognitive training improves its metacognitive level, and the other is due to a period of training to improve its metacognitive level, or the common cause of the two reasons. The metacognitive level of the control group did not change significantly before and after the experiment, which indicated that the change in the cognitive level of the experimental group was not caused by the exercise training. Therefore, the change of the metacognition in the experimental group could be ruled out by the exercise training.

The results of the experimental group were higher than those of the control group, and there was a significant difference ($P<0.05$). The previous results show that the experimental group has a higher metacognitive ability and significant difference than the control group, which indicates that the different metacognitive levels have a certain influence on the performance of the skill learning.

According to the results of different metacognitive abilities above, we can draw a conclusion that metacognitive ability is higher than that of sports skills. In this case, the scores of metacognitive ability are divided into groups, and the results of the experimental group and the control group are examined by T test.

There was a significant difference between the high metacognitive group and the low metacognitive group ($P < 0.01$). This fully shows that the higher the metacognitive students' martial arts are, the higher the metacognitive ability affects the learning results of motor skills.

The results of the same metacognitive ability between the experimental group and the control group were compared in order to further investigate the effect of metacognitive ability on the learning of sports skills. The scores of metacognition were divided into groups, which were divided into high metacognition group and low metacognition group. The T test was carried out between the experimental group and the control group, and the results were shown. There was no difference in the scores between the low metacognition group, the experimental group and the control group, but the results of the experimental group in the high metacognition group and the control group were significantly different. According to the previous conclusion, different metacognitive abilities have different grades. The scores of the high cognitive ability group were different from those of the control group, which was not consistent with the conclusion. Therefore, the metacognitive ability of the experimental group and the control group were investigated.

That there is no difference in the level of low metacognitive ability between the experimental group and the control group, but the difference in the level of high metacognition between the experimental group and the control group is very significant. It can be seen that although the experimental group and the control group are at a high level of metacognition, there are also differences between the experimental group and the control group, and the differences in their performance are also normal.

Experimental results of imagery training method.

Like many image training tests, in the teaching of martial arts technology in universities, the teaching effect of the image method is better than the traditional teaching method. In this experiment, after the experiment, the average technical examination results of the students are shown in Table 1.

**Table1. Test results of students**

| Group | Number of people | Juvenile boxing | Three long fist |
|---|---|---|---|
| Control group A | 20 | 77.70±5.01b | 76.30±6.13b |

| | | | |
|---|---|---|---|
| Experimental group B | 20 | 82.00±4.47a | 81.00±4.21a |
| Experimental group C | 20 | 82.85±4.23a | 83.80±3.44a |

Note: different letters in the same column show significant differences(p=0.05)

The results showed that the experimental group B, C and the control group A had significant differences (p=0.01) (F=7.261, df=2.59, P=0.002) in the results of the assessment of the juvenile boxing and the three way long fist. This shows that the action representation and the term representation have significant effect on the skill formation and teaching effect. However, there was no significant difference between the experimental group B and the experimental group C (P=0.56), that is, the action representation, the term representation and the simple term representation had no significant impact on the final results. This may have a great relationship with the evaluation index of examination results. In the scoring standard of the junior martial routine, the standard of action, the skillful routine and the strength are the important criteria. Previous studies have shown that the term representation helps students to establish action concepts and memorize various movements as much as possible. The action representation method is helpful in standardizing action details and improving the quality of action. Skillful routines and good motion coherence can make up for the insufficiency of the action specifications, but the action specifications are good and the pause in the routines will be deducted. Therefore, the term representation and action representation do not show obvious differences in the performance of the simple routines. From the data of this experiment, it can be seen that in the first face of the relatively simple test, the scores of the B group and the C group had little difference. The B group had a slight decrease in the second time of the slightly difficult movement, while the C group was able to keep up. This is because the movements are more difficult and the movement specifications are more difficult to grasp. The action representation deepens the understanding of the details of the action. As long as you can remember the routines, the action group in the score should be higher than the term representation. Therefore, in the university public sports, the students who have never been exposed to martial arts learning can use the terminology method when learning martial routines to help students carry on the action memory. The students can use the classroom video and action imagery, which is more conducive for the students to grasp the details of the movements, and better understand and master the routines.

## Ⅳ Conclusions

In the teaching of martial art technology, the proper use of cognitive training means to give full play to the cognitive function of the students, which helps to deepen the students' understanding of technology and speed up the mastery of skills.

In the teaching of martial art techniques, the methods of imagery practice, thinking practice, thinking practice and verbal practice can be adopted in the implementation of cognitive training.

In the teaching of martial art technology, the implementation of cognitive training means that the teachers must study the special technology in depth, and have the ability to combine the psychological training with the technology teaching well.

Metacognition has a certain influence on the learning of sports skills. Therefore, in the process of sports skills learning, we should pay attention to the training of metacognitive theory for students, make students master metacognitive knowledge, enrich metacognitive experience, improve metacognitive skills, make students plan their own plans and supervise themselves in the process of skill learning. The learning process is measured, and the learning method is adjusted according to the monitoring results, so as to better improve skill learning.

The imagery training method is better than the traditional teaching method in the university martial routine teaching, which is more beneficial to the students' memory and the quality of the action. The level of anxiety is relieved, the enhancement of self-confidence and the improvement of the appearance ability indicate that the effect of the

imagery training is obvious, and it is an important factor affecting the teaching effect. In view of the above advantages of the imagery training method, it is suggested that it should be popularized in the teaching of martial arts in universities, and the conditions with video can be used as a whole demonstration, because the action in the video is accurate and the level of practice is high, the students are more likely to arouse the desire of learning in the psychology of worship. At the same time, the effect of presentational training should be monitored timely to ensure that the imagery training method is implemented in the classroom.

**References**

Chen Y, Liu L, Zhou Q, Imam MU, Cai J, Wang Y, Qi M, Sun P, Ping Z, Fu X (2017) Body mass index had different effects on premenopausal and postmenopausal breast cancer risks: a dose-response meta-analysis with 3,318,796 subjects from 31 cohort studies. BMC Public Health 17 (936).

Han ZY (2018) The martial art design based on computer three-dimensional auxiliary system. Journal of Discrete Mathematical Sciences & Cryptography 21 (2): 601-605.

Qiu X, Zhang H, Yu H, et al. (2015) Duplex-specific nuclease-mediated bioanalysis. Trends in Biotechnology 33 (3): 180-8.

Rocco SC, Antonino N, Margherita R, et al. (2015) Do post-stroke patients benefit from robotic verticalization A pilot-study focusing on a novel neurophysiological approach. Restorative Neurology & Neuroscience 33 (5): 671-681.

Storzbach D, Twamley E W, Roost M S, et al. (2017) Compensatory cognitive training for operation enduring freedom/operation iraqi freedom/operation new dawn veterans with mild traumatic brain injury. J Head Trauma Rehabil 32(1): 16.

Ying L (2019) New Ecology: Chinese Traditional Martial Arts Culture Protection and Carry Forward Game Analysis. Ekoloji 28 (UNSP e107309107): 2773-2778.

Zhang M (2019) AHP Analysis on the Reform and Sustainable Development of Wushu Environment in Colleges and Universities under the New Situation. Ekoloji 28 (UNSP e107302107): 2729-2733.