EDUCARE:
International Journal for Educational Studies, 3(2) 2011

The Effect of Goal Setting and Mental Imagery Intervention on Badminton Learning Achievement Motor Skill at 10-12 Years Old: The Context of Indonesia

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ABSTRACT: The purpose of this research was to examine the influence of goal setting and mental imagery as two methods of psychological skill training on learning achievement of badminton motor skill. Fifty beginning female athletes at 10-12 years old (M = 10.8) from Bandung FPOK UPI Badminton School were divided into four experimental groups and one control group in random. Before getting the treatment, all groups carried out motor ability test, then all experimental groups were given following instructional about goal setting, mental imagery training, and badminton motor skill materials according to experimental condition in each group. It was hypothesized that shifting goal would more improve the development of high service and defensive clear skill than process goal, and mental imagery training would more enhance high service and defensive clear skill than without mental imagery training. The result of data computation by two ways factorial ANCOVA showed that goal setting and mental imagery training method given a significant main effect, but no interaction both of them. Furthermore, the result of means adjusted pair comparison analysis indicated that the effectiveness of mental imagery training influenced by goal setting but not vice versa. Mental imagery process of the mental imagery training group was significantly higher than without mental imagery training, and all experimental groups have a significantly learning achievement higher than control group.
KEY WORDS: Psychological skill training method, goal setting, mental imagery, learning achievement, badminton motor skill.

Introduction

Generally, the badminton development in club, school, or education and training level is started at about 6-14 years old. Its existence as the developmental stage to perpetuate regeneration process becomes very important. Moreover, the badminton club, school, or education and training is the only developmental center for those young age athletes and is one of the basic strategy to improve achievements in this sport. Therefore, its development needs to be implemented by planning, regularly, and systematically by empowering all supporting aspects of achievement which

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established as high as possible. The aspects are mainly related to training process simultaneously, i.e. physical ability, technical, and tactical or psychological skill.

This factual condition shows that the development of badminton achievement, which mainly in the level of badminton club, school, or education and training, was still lack of concern, especially in psychological aspect. The program was usually focused on the aspect development of physical and technical ability (Rahayu, 1997). The evidences showed that psychological skill training was a pivotal training in sport development. Patience, bravery, sportsmanship, self-confidence, motivation, etc. are some important psychological aspects in sport development. Those psychological aspects need to be developed and improved earlier through a specific method which is called psychological skill training method such as goal setting, mental imagery, self-talk, emotional management, and others.

Goal setting is a technique to set the learning goal orientation to be achieved which leads pupils' regulation thinking process in order to master the motor skill (Anderson, 1997; and Schunk & Ertmer, 1999). Goal setting plays an important role in educational process because it will help pupils to regulate their actions, to define their performance operationally, and to improve their learning achievement (Ames & Archer, 1988; and Caroll *et al.*, 1997). E.A. Locke *et al.* (1981) and D.H. Schunk and P.A. Ertmer (1999) divided goal setting into product goal and process goal. B.J. Zimmerman and A. Kitsantas (1997 and 1999), in their study, developed some types of shifting goal. The process goal is a goal that focused on skill acquisition process related to technique used or strategy that can help pupils to master a certain task. In the process goal, motor skill learning is conducted by dividing skill target into several sub-skills as behavior target (Schmidt & Wrisberg, 2000) or critical features (Knudson & Morrison, 1996). In contrast, the product goal is focuses pupils' attention on task completeness (Schunk & Ertmer, 1999). It focuses on high competence demonstration that is to be able to defeat others (Ames & Archer, 1988; and Eggen & Kauchak, 1999). The shifting goal is a combination between process goal and product goal. In the shifting goal, pupils began initally using process goals and then changed to product goal when the basic process has been mastered or when high service and defensive clear strategy was automated.

B.J. Zimmerman and A. Kitsantas (1997) were conducted the first study on shifting goal advantage comparing to process goal and product goal. It was reported that the shifting goal experiment shows the highest result in acquisition of dart throwing motor skill, self-efficacy, self-reactions, and intrinsic interest level. Meanwhile, the lowest result was achieved by product goal experiment group and the result of process goal was between shifting and product goal. The goal could influenced motor skill learning achievement because it points the focus directly to the important aspects from the skill learned, mobilizes effort, improves persistence, and develops new ways in learning (Locke *et al.*, 1981; Gould, 1993; and Cox, 2002). It will also indirectly influences psychological aspects such as anxiety, conviction, satisfaction, and motivation (Gould, 1993).

Mental imagery is a set of activity to create or recreate in mind a correct object, occurrence or motor experience, and kept in memory (Blischke *et al.*, 1999). Various

result of studies showed that mental imagery could facilitate sport-performance improvement (Vealey & Walter, 1993; and Kossert & Chandler, 2007). Mental imagery can be used to enhance sport performance in various sport, both elite or non-elite athletes. For example, to improve accuracy and quality of *table tennis strokes* (Li-Wei *et al.*, 1992), *basketball free throw* (Onestak, 1997; and Ramsey, Cumming & Edwards, 2008), *golf* (Thomas & Fogarty, 1997; Jae-Hoon & Dug, 2003; and Peluso *et al.*, 2005), *handball shooting* (Thill, Mailhot & Mounda, 1998), *hockey* (Smith *et al.*, 2001), *shooting performance in biathlon* (Groslambert *et al.*, 2003), *water-ski* (Callow, Roberts & Fawkes, 2006), *swimming* (Pavlidou & Doganis, 2008), *high jump* (Olsson, Johnson & Nyberg, 2008), *rock climbing* (Jones *et al.*, 2002), and so on.

According to R. Marten (1987) and R.H. Cox (2002), goal setting and mental imagery were the integral part of the whole psychological skill method. Goal imagine is an effective way to direct the athletes on a goal fulfillment and mental imagery can work effectively as the athlete set their goal specifically and realistically during mental imagery training. The more obvious and detail the object or the motor imaged, the more possible pupils will be able to see the chances they can achieve in their learning goal (Shone, 1984). Besides, by creating specific picture or image, pupils can decide critical aspects or key components that have to be the focus during the learning process (Syer & Connoly, 1990). As a result, the goal will be easier and faster to be achieved. According to this, the goal can be imaged and imaging process must be directed on goal. It is the best way to do mental imagery (Shone, 1984).

The responsibility of the coach, related to both psychological skills method above, is to attempt both implementation into integral part of the whole developing process, especially in acquisition learning process of badminton motor skill. It is because the effective and efficient acquisition is one of the standard determinants of an athlete's sport achievement. The two of the main badminton motor skills which was firstly taught and having simplest motor complexity but plays an important role are high service and defensive clear.

High service is one of the most frequent services used and it plays important role in single (Poole, 1988). It is a service that points the shuttle cock high and far behind. Then, the shuttlecock will turn over and fall as close as possible at the back boundary line (Grice, 1996). Thus, the opponent will move to the back part of the court and the front part of the defensive area will be widely open. Besides, high service can also be very difficult to be shot since the shuttlecock will fall upright to the floor (Davis, 1998).

One type of overhead stroke often used and plays important role, especially in single, is defensive clear (a high lob to the back part of the court). Defensive clear is a stroke done from overhead by forehand and the direction of the shuttlecock will fly-over to the opponent's back part of the court. Its aim is to defend or to get parity to the position before (Edward, 1997; and Davis, 1998). Acquisition defensive clear is crucial since it is not only used often in single, but also the basic stroke to develop another strokes. The perfectly acquisition of both skills is crucial, since the technique of the stroke will determine the whole movements. It is not

only adequate to train the pupils physically, but certain psychological techniques are needed as well.

Based on the description, this study was intended to identify causal relation between psychological skill training method of goal setting and mental imagery to the learning achievement of badminton motor skill for high service and defensive clear strokes by involving motor ability as co-variable.

The hypothesis proposed in this study are: (1) the learning achievement of high service and defensive clear motor skill given the shifting goal treatment is higher than process goal; (2) the learning achievement of high service and defensive clear motor skill given the mental imagery treatment is higher than not; (3) the learning achievement of high service and defensive clear motor skill that its learning oriented in shifting goal is higher than oriented in process goal to pupils given the mental imagery treatment or not; and (4) giving the mental imagery treatment will provides higher influence on learning achievement of high service and defensive clear motor skill than giving no mental imagery treatment to pupils oriented in shifting goal or oriented in process goal.

Methodology

The study was conducted in Badminton Education and Training for Young Age in the School of Physical and Health Education UPI (*Universitas Pendidikan Indonesia* or Indonesia University of Education) in Bandung in 2008. Fifty female pupils of 10-12 years old (mean = 10.8) were the subjects of this study. They were divided into four experimental groups and one control group by selected random.

The instruments used in this study were included badminton motor skill test (*high service* and *defensive clear* tests), motor ability test, questionnaires of learning mental imagery process of high service and defensive clear motor skill, interview, and Focus Group Discussion (FGD). The high service test was used to measure subject's ability in doing stroke with racket swing from down to up in order to direct shuttlecock high and far to the back of the border part of opponent's line. The validity coefficient was .60 and the reliability was .87. The defensive clear test was used to measure pupils' ability in doing high and long stroke to the back part of opponent's court. The type of the test used was the test made by Indonesian Recreational and Physical Fitness Center, the Department of Education and Culture in cooperation with Young-Age Badminton Training and Development Center BM 77 Bandung, West Java, Indonesia (1995/1996).

The validity alpha coefficient of this test was .74 and the reliability was .897. The motor ability test was used to measure subject's ability in performing motor skill and physical activity entirely. The type of the test used was motor ability test for elementary children developed by Arnheim and Sinclair (Kirkendall, Gruber & Johnson, 1980).

The questionnaire of mental imagery process was used as manipulative verifying procedure on mental imagery process. The writer developed it with reference

to Mental Imagery Questionnaire by R. Marten (1987) consisting of 38 items. The items were described in two constructs of dimension, that is vividness and controllability. The alpha coefficient from the questionnaire was 0.86. The interview and FGD were conducted towards the subjects who were not given mental imagery treatment and in control group. The subjects were three persons that were from EG-1, EG-4, and G-5. The interview and FGD (Focus Group Discussion) were used as the additional instrument to obtain additional information about the feasibility of process or result goal creation on research subject.

The research design used was 2x2 factorial design. The implementation of the study was divided into three stages: preparation, implementation, and final stage. The preparation stage consisted of pre-experimental sub-stage, subjects' selection, and motor ability test implementation. The treatment giving stage were education and training sub-stages. While the final stage including sub-stage of manipulative verification and final test.

The experimental condition was based on determining classification of process and shifting goal, mental and non-mental imagery training classification as well. Thus, there were four experimental groups: (1) EG-1 or first experimental group which combined shifting goal with imagery mental training; (2) EG-2 or second experimental group which combined process goal with mental imagery training; (3) EG-3 or third experimental group which combined shifting goal with non-mental imagery training; and (4) EG-4 or fourth experimental group which combined process goal with non-mental imagery training, and one additional group called G-5 or the control group. Every group was placed in two different courts and separated from each other – then the groups conducted motor skill training of high service and defensive clear.

The hypothesis testing was conducted by using Two Way Factorial Ancova. Meanwhile, the manipulative verification data was analyzed by analytical technique of two mean (t-student). One Way Ancova was used to verify the comparison control group and all experimental groups; and omega-square ($\omega 2$) was to provide information useful for evaluating the practical of statistically significant value of Two Way Factorial Ancova, t-Student, and One Way Ancova. Besides that, it was also used for interview and FGD that were analyzed with content and inductive analysis.

Result

According to the summary of Two Way Factorial Ancova in table 2 below, it is known that there were no significant result interaction between goal setting and mental imagery training. It was proved by the value of $F (1.35) = .013$ and $p = .906$ (insignificant), and the omega square index ($\omega 2$) = –.2 or –2%.

Table 1 and 2 displays $F (1.35) = 6.029$ and $p = .018$ (significant), the mean of learning achievement of high service and defensive clear badminton motor skill given shifting goal ($M = 68.841$) has higher learning achievement than those were

given process goal (M = 63.659). As conclusion, the pupils who were given shifting goal had significantly higher learning achievement of high service and defense clear badminton motor skill than those who experienced process goal. Thus, *the hypothesis was accepted.* The power of treatment influence was proved by omega square index = .12 or 12%.

Table 1
Means and Standard Deviations for the Learning Achievement of High Service and Defensive Clear Badminton Motor Skill

			Goal Setting (A)	
			Process Goal (A_1)	**Shifting Goal (A_2)**
Imagery (B1)	Means	71.375	74.086	68.665
	SD	9.165	8.497	8.820
Without Imagery (B2)	Means	61.125	63.597	58.652
	SD	4.642	4.253	3.390
Process Goal (A1)	Means	68.841	---	---
	SD	8.975	---	---
Shifting Goal (A2)	Means	63.659	---	---
	SD	8.686	---	---
Control	Means	56.544	---	---
	SD	4.724	---	---

Table 2
Result Summary of Two Way Factorial Ancova for Learning Achievement of High Service and Defensive Clear Badminton Motor Skill

Source	df	Sum Square	Mean Square	F	p
Inter A	1	266.795	266.795	6.029	.018*
Inter B	1	988.897	988.897	22.346	.000**
Inter AB	1	.574	.574	.013	.906
Inside	35	1548. 871	44.253	----	----
Total	38	1805.137	----	----	----

* = p < .05; ** = p < .01

As shown in table 1 and 2, it was resulted that F (1.35) = 22.346 and p = .000 (very significant). The mean of the learning achievement in high service and defensive clear badminton motor skill given the mental imagery treatment (M = 71.375) was higher than which not given (M = 61.125). As conclusion, the pupils who were given mental imagery treatment had significantly better learning achievement in high defensive and defensive clear badminton motor skill than who were not given. Thus, *the hypothesis was accepted.* The omega square of index number was .51 or 51%.

According to table 2 and 3, the result of pair comparison A_1B_1-A_2B_1 was the value of t = 1.848 and p = .070 (not significant). The mean of A_1B_1 (M = 74.086) is higher than A_2B_1 (M = 68.665). It means that the shifting goal gives insignificantly

higher influence than the process goal towards the learning achievement of high service and defensive clear badminton motor skill. Hence, there was no significant influence between shifting goal and process goal on the learning achievemenet of high service and defensive clear in pupils who experienced mental imagery training. After verified by omega square analysis, the index number was .113 or 11%.

Table 3
Result Summary of Post Hoc Pair Comparation of Two Way Factorial Ancova in the Score of Learning Achievement of High Service and Defensive Clear Badminton Motor Skill

A,B	1,1	1,2	2,1	2,2
1,1	.000	3.576	1.848	5.261
p	1.000	.001**	.070	.000**
1,2		.000	-1.728	1.686
p		1.000	.089	.097
2,3			.000	3.413
p			1.000	.002**
2,2				.000
p				1.000

* = p < .05; ** = p < .01

From the pair comparison of A_1B_2-A_2B_2, the value of t = 1.686 and p = .097 (not significant). The mean of A_1B_2 (M = 63.597) is higher than A_2B_2 (M = 58.652). This result showed that the shifting goal gives insignificantly higher than the process goal setting towards the learning result of high service and defensive clear badminton motor skill. Hence, there was no significantly different influence between shifting goal and process goal toward the learning achievement on high service and defensive clear badminton motor skill to the pupils who did not experience mental imagery training treatment. Thus, *the hypothesis was not accepted.* The index value of omega square was 0.084 (8%).

From the pair comparison A_1B_1-A_1B_2, the value of t = 3.576 and p = .001 (very significant) with the mean A_1B_1 (M = 74.086) is higher than A_1B_2 (M = 63.597). This result showed that mental imagery training gives significantly higher influence than non-mental imagery training towards the learning achievement of high service and defensive clear badminton motor skill. Thus, the hypothesis was accepted. This result was built up by the result of omega square analytical test with index number of .371 or 37%.

The pair comparison of A_2B_1--A_2B_2 produced the value of t = 3.413 and p = .002 (very significant). Meanwhile, the mean of A_2B_1 (M = 68.665) is higher than A_2B_2 (M = 58.652). As conclusion, the mental imagery training gives significantly higher influence than the non-mental imagery training on the learning achievement of high service and defensive clear badminton motoric skill. Thus, *the hypothesis was*

accepted. The connection of index level reflects the power of treatment influence after analyzed by omega square test and the value was .347 or 35%.

Table 4 below shows the summary of the t-test analysis inter-groups. It shows that t = 4.864 and p = .000 (very significant), the mean of group A_1 (M = 31.700) is higher than the mean of group A_2 (M = 21.530). It means that there was a significant difference in mental imagery process between group whose subjects experienced imagery mental training with group whose subjects did not experience.

Table 4
Summary of t-Test Analytical Result Inter-Groups

Group	N	∑X	∑X'	Mean	Standard Deviation	Group	X
A_1	20	634	20846	31.700	6.275		4.864
A_2	20	427	10089	21.530	7.154	A_1-A_2 p	.000*

* = p < .05; ** = p < .01

Based on the analytical result in table 5, the value of F (4.44) is 12.275 and p = .000 (very significant). It means, there is a significant difference between group A. Furthermore, to more identify which group is significantly different, pair comparison analysis was used as shown in table 6.

Table 5
Summary of One Way Ancova of High Service and Defensive Clear Badminton Motor Skill

Source	Sum Square	df	Mean Square	F	p
Inter A	2.297.001	4	574.250	12.275	.000**
Inside	1.985.616	44	45.128	---	---
Total	4.282.617	48	---	---	---

* = p < .05; ** = p < .01

It can be concluded that the learning achievement from all experimental groups was significantly higher than the learning achievement from control group. The two experimental groups, EG-1 [t = 6.048; p = .000; ω^2 = .64 (64%) and EG-2 (t = 4.131; p = .000; ω^2 = .45 (45%)] showed a very significantly higher learning achievement. Meanwhile, EG-3 learning achievement is significantly higher with its value of 2.292; p = .025; and ω^2 = .18 (18%). When comparing to EG-4, there was no significant difference and the value of t = .437; ρ = .668; and ω^2 = is .04 (4%).

According to comparative analytical result between experimental groups, it was proved that EG-1 was insignificantly higher than EG-2 with the value (t = 1.917; p = .059; ω^2 = .12 (12%) and was significantly higher with EG-3 (t = 3.755; p = .001; ω^2 = .40 (40%) and EG-4 (t = 5.611; p = .000; ω^2 = .60 (60%). EG-4 was insignificantly different from EG-3 with its value of t = .839; ρ = .069; ω^2 = -.02

(-2%), yet it is significantly higher than EG-4 (t = 3.694; p = .001; ω^2 = .39 (39%). Last, EG-3 was insignificantly higher than EG-4 with its t value =1.855; p = .067; and index ω^2 = .11 (11%).

Table 6
Summary of t-Test between A and Omega Square Index of High Service and Defensive Clear Badminton Motor Skill

Source	X_1	ω^2	Source	X_1	ω^2
A1-A2	1.917		A2-A4	3.694	
p	.059	.12 (12 %)	p	.001**	.39 (39 %)
A1-A3	3.755		A2-A5	4.131	
p	.001**	.40 (40 %)	p	.000**	.45 (45 %)
A1-A4	5.611		A3-A4	1.855	
p	.000**	.60 (60 %)	p	.067	.11 (11 %)
A1-A5	6.048		A3-A5	2.292	
p	.000**	.64 (64 %)	p	.025*	.18 (18 %)
A2-A3	.839		A4-A5	.437	
p	.069	-.02 (-2 %)	p	.668	-.04 (-4 %)

* = p < .05; ** = p < .01

Discussion

The evidence of subject's group in which the learning oriented in shifting goal has significantly higher in learning achievement of high service and defensive clear badminton motor skill than the process goal supports the result of previous study about the advantage of shifting goal from process goal and product goal conducted by B.J. Zimmerman and A. Kitsantas (1997 and 1999). One of the reasons to explain this result is that goal shifting introduces pupils about the importance of knowledge of result from motor skill learned by them. Pupils understand the importance of final product through learning process they do and it is not only able to reduce meta-cognitive demand from the skill that needs to be performed, but also to improve their motivation.

By having proven that shifting goal gives significantly higher influence than process goal, it gives information on the existence of multiple goal strategy. It means that to master a motor skill more effectively and efficiently, pupils can set their learning goal they want to achieve hierarchically. Moreover, the learning achievement of motor skill will be more effective if the learning process oriented to more than just one goal setting.

The accepted hypothesis that stated the mental imagery training gives higher influence than the non-mental imagery training toward learning achivement of high

service and defensive clear badminton motor skill supports the previous finding results (Li-Wei *et al.*, 1992; Peynircioglu, Thompson & Tanielian, 2000; Smith *et al.*, 2001; Jae-Hoon & Dug, 2003; Peluso *et al.*, 2005; and Callow, Roberts & Fawkes, 2006). The pupils who experienced mental imagery training felt as if they had exercised twice, firstly in their minds and secondly in reality. This result also supports the evidence that the combination of mental imagery with motor skill training will actually give better result than the separation of the training (Hall *et al.*, 1998; Bar-Eli *et al.*, 2002; and Cumming, Hall & Shambrook, 2004).

Based on symbolic learning and bio-informational theory, mental imagery has cognitive function that can be used to perform and to repair specific motor skills. A. Paivio (1985), also cited by J. Byod and K.J. Monroe (2003), called it *cognitive specific imagery*. The mental imagery training helps pupils create mental blue-print and develop mental plan about ways to perform motor skill that they will learn. All those mental plans can ease motor skill training process. It is because pupils can firstly exercise the skill they want to learn mentally in mind.

This evidence also emphasizes on the importance of mental imagery training in motor skill learning process to be implemented. It is based on several functional-practical reasons, that is: (1) as a supplemental training before and after training, even in spare time while waiting for the turn to exercise, especially if the class is abundant of pupils; (2) as device to train cognitive skill of pupils; (3) as device to accelerate the process of motor skill acquisition and more accurate motor response formation; and (4) giving influence to improve psychological aspects according to some studies.

C. Hall *et al.* (1998) called the last function as *the motivational specific function of imagery* which they described as a function to imagine goal fulfillment. Related to success performance, this motivational function is proved to be able *to increase motivation* (Fulgham, 1998; and Kitsantas & Zimmerman, 1998); *to repair readiness level of regulation* (Haslam, 1990; and Gordon, Weinberg & Jackson, 1994) and *anxiety* (Magyar & Chace, 1996; and Marks, 1999); *to improve self-eficacy* (Morris & Thomas, 1995; and Perry & Morris, 1995); and *self-confidence* (Fulgham, 1998; Cumming, Hall & Shambrook, 2004; and Callow, Roberts & Fawkes, 2006).

The unaccepted hypothesis that stated the learning achievement of high service and defensive clear motor skill its learning oriented in shifting goal is higher than oriented in goal process to pupils given the mental imagery treatment or who not given proves that the difference of both kinds of goal setting effectively are not influenced by mental imagery training. This means that although every part of movement, all motor serial, and its final result of performance are imagined before, otherwise, it won't be the appearance of significant different influence between the two kinds of goal setting.

Methodological reason caused the unaccepted hypothesis above. As it is known, the implementation treatment to the experimental group 1 (EG-1) with experimental group 2 (EG-2) was not controlled strictly. Every group was placed into two separated courts, yet still in the same sport building and it was the same treatment

as to EG-3 and EG-4. This condition caused the influence of psychological and social aspect that could not be controlled well, as in the possibility of diffusion and novelty effect. In other words, the subject of the study could not be controlled well because the weakness to harness situational difference. Yet one of the characteristics in the experimental study is controlling (Furchan, 1982; and Masrun, 1984).

The fact mental imagery training gives insignificantly higher influence on the learning achievement of high service and defensive clear badminton motor skill than the non-mental imagery training to either pupils given process goal treatment or shifting goal proved that the effectiveness of mental imagery training influence toward the learning achievement of high service and defensive clear badminton motor skill is influenced by goal setting, either process or shifting goal. According to this result, if pupils want to begin mental imagery training, firstly they must know and understand their goal. They also must set their goal from every motor skill that will be imagined. It is because goal is the basic thing from all mental training (Porter & Foster, 1986), including the mental imagery training. Distincness and pupils' ability level to control the correct motor during mental imagery training are influenced by how sharp and detail the goal has been set. As a result, imagery training will work if the training process is directed to the goal (Porter & Foster, 1986; and Marks, 1999). This result was supported by the result on omega square significant test in which the value of omega square is .35 (35%) and .38 (38%).

The significant difference in mental imagery training process between the groups that given the treatment and not is an indication of the inexistence of informative diffusion process between groups' subjects given the treatment and not. The score which was obtained by subject group who did not experience mental imagery training treatment is a real image from imagery ability as potential ability owned by every subject and is one of the factor which moderate mental imagery influence toward the improvement of performance (Perry & Morris, 1995).

Entirely, all experimental groups had very significantly higher learning achievement of high service and defensive clear badminton motor skill than the control group, except when comparing to experimental group of process goal (EG-4) and it was comparable statistically. This fact is presumably caused by the same instructional orientation, which both are directed to process goal. The evidence indicated that experimental group 1, 2, and 3 had significantly higher than the control group supports the previous studies about psychological skill learning method influence effectiveness, especially goal setting and mental imagery training toward learning improvement and performance (Gould, 1993; Gordon, Weinberg & Jackson, 1996; Fulgham, 1998; and Bar-Eli *et al.*, 2002). Therefore, psychological skill training as an educational training program in order to develop and improve psychological physical skill simultaneously should be the integral part of physical and technical training program existing nowadays. It is because many results of studies showed that psychological training was as crucial as physical training in the effort to improve technical skill (Fulgham, 1998).

Conclusion and Recommendation

The psychological skill training method of mental imagery and goal setting influences the learning achievement of high service and defensive clear badminton motor skill, but the standard of motor skill learning achievement intended was not determined by interaction between goal setting and mental imagery training.

The instructional oriented on shifting goal gave higher motor skill learning achievement than process goal learning achievement and motor skill instructional which was completed with mental imagery training shows higher learning achievement than instructional with only using physical or technical training. Goal setting influences the instructional effectiveness completed with mental imagery training. In contrast, mental imagery training does not influence the learning achievement effectiveness oriented on goal setting.

It is necessary to integrate psychological skill training method of goal setting and mental imagery into the existing training program in a whole. Teacher, trainer, sport coach, and policy maker have jobs and responsibility to design the structure and the schedule to make them uninterrupted by the existing program.

Advanced study should be conducted to apprehend the influence of psychological skill training method either on physical skill aspect acquisition or on psychological skill aspect development by involving advanced subject development in club, educational and training, school, educational and training center, or national level. Moreover, another psychological skill method needs to be concerned, such as emotional management, self-talk, interpersonal relation, and others.

There are a lot of teachers, trainers, athletes, and coaches who do not understand well about the substance and the importance of psychological skill training method of mental imagery and goal setting in sport development. Therefore, it is necessary to conducts socialization through a training, workshop, panel discussion, or seminar involving related parties including psychologists.

Manipulative verification for mental imagery training method can be implemented not only through questionnaires as in this study, but also through reviewing motor skill understanding which will be imagined and physiological responsive measurement, such as pulse, respiratory rhythm, and muscles movement related to the movement which will be conducted through *electromyographic* device.

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There are a lot of teachers, trainers, athletes, and coaches who do not understand well about the substance and the importance of psychological skill training method of mental imagery and goal setting in sport development.