

## Effect of Mental Imagery and Goal Setting on Skills of Basket Ball Players

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### Abstract

The purpose of the study was to analyze the effect of eight weeks training of mental imagery and goal setting on skill acquisition i.e. dribbling, passing, defense and shooting of 15 female basketball players at the university level. It was a single group design in which fifteen female basketball players of university level were randomly selected. The sports imagery questionnaire was used for measuring the imagery ability of the individuals and AAPHERD Basketball skill test was used to evaluate the four different skills of the individuals. The pre, during and post data was collected within a gap of four weeks respectively. The responses given by the subjects were analyzed by using one way analysis of variance (ANOVA) and then further the LSD test was applied to see the difference among the different variables.

**Keywords:** Acquisition, AAPHERD, ANOVA

### Introduction

Psychological skills have long been considered an integral part of what makes an athlete successful at elite levels White and Hardy (1998) suggest that through imagery “we can be aware of ‘seeing’ an image, feeling movements as an image, or experiencing an image of smell, taste or sounds without experience the real thing”. Hall (2001) has suggested that imagery can serve as an effective supplement to regular physical practice and as a substitute for some amounts of physical practice when

athletes are unable to train.

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. Goal setting plays an important role in educational process because it helps pupils to regulate their actions, to define their performance operationally, and to improve their learning achievement (Ames & Archer, 1988; and Carroll *et al.*, 1997).

The process goal is a goal that focuses

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on skill acquisition process related to technique used or strategy that can help players 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 feature (Knudson & Morrison, 1996). In contrast, the product goal 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 initially 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.

### **Method**

The players were evaluated on the five criteria of Sports Imagery Questionnaire measuring various aspects of imagery. The five criteria on which the players were judged are

1. Motivational specific.
2. Motivational imagery.
3. Motivational general.
4. Cognitive specific.
5. Cognitive general.

The skills of the player were evaluated on the four test items of AAPHERD Basketball test battery. The test battery includes the following test items

1. AAPHERD Basketball Speed Shot Shooting Item.
2. AAPHERD Basketball Passing Testing Item.
3. AAPHERD Basketball Control Dribble Test Item.
4. AAPHERD Basketball Defensive Movement Test Item.

The AAPHERD Basketball skill test was used to measure the skill competencies of the individuals as it had a reliability co-efficient ranging from 0.84 to 0.98.

After the pre test was over the players were informed about their performance in imagery as well as skills. They were asked to set goals both in imagery and various skills. After setting the goals they were given training. The training was for a total period of 8-weeks, three times a week, for a time period of 30-35 minutes of each session. The training included orientation of players, relaxation of players followed by the mental imagination of various aspects of skill, again relaxation and then finally the feedback was taken.

After 4-weeks of training during testing on the same parameters was done; data was collected and it was checked if there was any improvement. The players were intimated regarding their performance both in their imagery ability and skills. It was seen whether the players had reached their goals or not. According to that again the training was imparted.

Finally, after 8-weeks of training a post test was taken on the same parameter of SIQ and AAPHER Basketball Test Battery. Then the data was collected and was compared to pre, during and post test to find out whether the players had achieved their goals or not.

To analyse the skill acquisition of female basketball players “One Way Analysis of Variance” (ANOVA) was used to find out the differences at 0.05 level of significant among the groups.

Table 1, shows the Mean and Standard Deviation of pre, during and post data of 15 subjects. The Mean and the Standard Deviation of SIQ (sports imagery questionnaire) the pre, during and post data were 24.14 ±4.67, 25.64±4.43 and 28.28±3.31 respectively. The Mean and Standard

Deviation of AAPHER BASKETBALL SPEED SHOT SHOOTING ITEM the pre, during and post data were 16.67 ±3.74, 18.47 ±3.07 and 20.07 ±3.41 respectively. The Mean and Standard Deviation of AAPHER BASKETBALL PASSING TESTING ITEM the pre, during and post data were 15.84 ±1.75, 13.95 ±1.36 and 12.94 ± 1.27 respectively. The Mean and Standard Deviation of AAPHER BASKETBALL CONTROL DRIBBLE TEST ITEM the pre, during and post data were 11.32 ±0.43, 10.94 ±0.39 and 10.57± 0.53 respectively. The Mean and Standard Deviation of AAPHER BASKETBALL DEFENSIVE MOVEMENT TEST the pre, during and post data were 13.19 ± 0.66, 12.53± 0.74 and 11.71 ± 0.77 respectively.

**ANALYSIS OF DATA AND RESULTS OF THE STUDY**

**Table 1:** Descriptive Mean value of pre, during and post data of sports imagery questionnaire

		N	Mean	S.D	STD.ERR.	MIN.	MAX.
SIQ	Pre	15	24.14	4.67	1.21	13.82	29.82
	During	15	25.64	4.43	1.14	14.33	30.16
	Post	15	28.28	3.31	0.86	20.56	32.45
SH	Pre	15	16.67	3.74	0.96	8.00	22.00
	During	15	18.47	3.07	0.79	13.00	24.00
	Post	15	20.07	3.41	0.88	14.00	26.00
PAS	Pre	15	15.84	1.75	0.45	13.80	19.60
	During	15	13.95	1.36	0.35	12.09	16.84
	Post	15	12.94	1.27	0.32	11.00	15.78
DRIB	Pre	15	11.32	0.43	0.11	10.50	11.90
	During	15	10.94	0.39	0.10	10.18	11.65
	Post	15	10.57	0.53	0.14	9.40	11.10
DEF	Pre	15	13.19	0.66	0.17	12.10	14.40
	During	15	12.53	0.74	0.19	11.25	14.17
	Post	15	11.71	0.77	0.20	10.20	12.90

**Table 2:** One-way analysis of variance of PRE, during and Post data of Sports Imagery Questionnaire

	Sum of Squares	Df	Mean Square	F	Sig.
Between Group	132.14	2	66.07	3.78	.031
Within Groups	734.26	42	17.48		
Total	866.40	44			

\*F ratio at df (2,42) = 3.22

Table 2, shows the Mean values of Between Groups and Within Groups that were 66.07 and 17.48 respectively. Calculated F-ratio at 0.05 level of significance with (2,42) degree of freedom was 3.78 whereas, it was found that tabulated f-ratio at 0.05 level of significance with (2,42) degree of freedom was 3.22. As calculated f-ratio is more than tabulated f-ratio, we can say that there is significant difference between pre, during and post data at 0.05 level of significance.

Table 3, shows the application of Post

hoc Test, due to equal sample size LSD test was applied. It was seen that Mean value of pre data and post data had a significant difference. Whereas, it was seen that there was no significant difference seen in the Mean value of pre and during data and also between Mean values during and post data which were taken after every four week of training respectively, as the total period of training was of eight week. Therefore, it was interpreted that improvement in the ability of imaging need a long term training of at least eight week.

**Table 3:** Multiple comparison of pre, During and post data of sports imagery questionnaire

(I) Phase of training	(J) phase of training	Mean Difference (I-J)	Std. Error	Sig.
Siq pre	Siq during	-1.50	1.53	.33
	Siq post	-4.15*	1.53	.01
Siq during	Siq pre	1.50	1.53	.33
	Siq post	-2.64	1.53	.09
Siq post	Siq pre	4.15*	1.53	.01
	Siq during	2.64	1.53	.09

\*. The mean difference is significant at the 0.05 level.

**Table 4:** One-way analysis of variance of pre-during and post data of aapherd basketball speed shot shooting item

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	86.80	2	43.40	3.72	.03
Within Groups	490.00	42	11.67		
Total	576.80	44			

\*F ratio at df(2,42)=3.22

Table 4, shows the Mean value of Between Groups and Within Groups that were 86.80 and 490.00 respectively. Calculated F-ratio with (2,42) degree of freedom was 3.72 whereas, it was found that tabulated f-ratio with (2,42) degree of freedom was 3.22. As calculated f-ratio is more than tabulated f-ratio, we can say that there is significant difference between pre, during and post data at 0.05 level of significance.

Table-5, shows the application of Post hoc Test, due to equal sample size LSD test was applied. It was seen that Mean value of pre data and post data had a significant difference. Whereas, it was seen that there was no significant difference seen in the Mean values of pre and during data and also between Mean values during and post data which were taken after every four week of training respectively, as the total period of

**Table 5:** Multiple comparison of pre, during and post data of aapherd basketball speed shot shooting item

(I) Phase of training	(J) Phase of training	Mean Difference (I-J)	Std. Error	Sig.
Shooting pre	Shooting during	-1.80	1.24	.15
	Shooting post	-3.40*	1.24	.01
Shooting during	Shooting pre	1.80	1.24	.15
	Shooting post	-1.60	1.24	.21
Shooting post	Shooting pre	3.40*	1.24	.01
	Shooting during	1.60	1.24	.21

\*. The mean difference is significant at the 0.05 level

training was of eight week. Therefore, it was interpreted that improvement in the ability of shooting need a long term training of at least eight week.

Table 6, shows the Mean values of Between Groups and Within Groups that were 65.12 and 91.57 respectively. Calculated F-ratio with (2,42) degree of freedom was 14.93 whereas, it was found that tabulated f-ratio with (2,42) degree of freedom was 3.22. As calculated f-ratio is more than tabulated f-ratio, we can say that there is

significant difference between pre, during and post data at 0.05 level of significance.

Table 7, shows the application of Post hoc Test, due to equal sample size LSD test was applied. It was seen that Mean value of pre, during and post data were different at 0.05 level of significance. Therefore, it was interpreted that there was positive effect of training on the ability of passing.

**Table 6:** One-way analysis of variance of pre, during and post data of aapherd basketball passing testing item

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	65.12	2	32.56	14.93	.000
Within groups	91.57	42	2.18		
Total	156.69	44			

\*F ratio at df(2,42) =3.22

**Table 7:** Multipile Comparison of Pre, During and post data of aapherd basketball passing testing item

(I) phase of training	(J) phase of training	Mean Difference (I-J)	Std. Error	Sig.
Passing pre	Passing during	1.89*	.54	.001
	Passing post	2.90*	.54	.000
Passing during	Passing pre	-1.89*	.54	.001
	Passing post	1.01	.54	.067
Passing post	Passing pre	-2.90*	.54	.000
	Passing during	-1.01	.54	.067

\*. The mean difference is significant at the 0.05 level

**Table 8:** One-way analysis of variance of pre-during and post data of aapherd basketball control dribble test item.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.25	2	2.13	10.19	.000
Within Groups	8.75	42	.21		
Total	13.00	44			

\*ratio at df (2,42)=3.22

Table 8, shows the Mean value of Between Groups and Within Groups that were 4.25 and 8.75 respectively. Calculated F-ratio with (2,42) degree of freedom was 10.19 whereas, it was found that tabulated f-ratio with (2,42) degree of freedom was 3.22. As calculated f-ratio is more than tabulated f-ratio, we can say that there is significant difference between pre, during and post data at 0.05 level of significance.

Table 9, shows the application of Post hoc Test, due to equal sample size LSD test was applied. It was seen that Mean value of pre, during and post data had a significant difference at 0.05 level of

significance. Therefore, it was interpreted that there was a positive effect of training on the ability of dribbling.

**Discussion of Findings**

Significant differences were obtained in the pre, during and post data of 5 different variables (sports imagery questionnaire, speed shot, control dribble, passing, defensive movement)when compared with each other. This significant difference is attributed to the 8 weeks of psychological training that included mental training and goal setting.

**Table 9:** Multiple comparison of pre, during and post dat of aapherd basketball control dribble test item

(I) phase of training	(J) phase of training	Mean Difference (I-J)	Std. Error	Sig.
Dribbling pre	Dribbling during	.38*	.17	.03
	Dribbling post	.75*	.17	.00
Dribbling during	Dribbling pre	-.38*	.17	.03
	Dribbling post	.37*	.17	.03
Dribbling post	Dribbling pre	-.75*	.17	.00
	Dribbling during	-.37*	.17	.03

\*. The mean difference is significant at the 0.05 level

It was seen that the performance related to the different variables has improved and a significant difference was seen in the mean and standard deviation of pre, during and post data of 3 different variables i.e. defensive movement, control dribble and passing when compared with each other. Whereas it was analyzed that there were two factors i.e. sports imagery questionnaire and speed shooting in which no significant differences were seen in the during data which was taken in the interval of four weeks training when compared to both pre and post data which was taken after 8 weeks of training. There were no significant differences seen in the shooting ability, because of the different individual competencies towards the skill and also because the subjects were undergoing only the specific mental training and not the specific training program related to shooting. The ability of imagery is also individual specific and due to different intellectual abilities of the subjects there were no differences recorded. Since the psychological parameters take more time to be improved in comparison to the physical parameters there was no significant difference recorded in the short duration of the training period. Filling up a questionnaire needs a lot of concentration and this was probably lacking in the players that resulted in no significant differences.

After the analysis of data it was found that, there were significant differences in the pre, during and post performance of different factors (sports imagery

questionnaire, speed shooting, passing, control dribble, defensive movement). Hence the hypothesis was accepted at the 0.05 level of significance.

Comparison of the coefficients of correlation between jump shot and physical fitness variables did not reveal significant difference among the three groups.

Consequent to the findings of no significant difference among the three groups for the relationship between jump shot shooting and physical fitness variables, the null hypothesis has not been rejected.

When the playing ability as rated by three judges, was rated with physical fitness variables it was found that there was no significant relationship between playing ability and physical fitness for any of the groups. It would be reasonable to conclude that playing ability in basketball is quite different form and independent of the sum total of the player's physical fitness. Perhaps some of the coordinated abilities are more relevant to the game of basketball.

The comparison of coefficients of correlation between playing ability and physical fitness variables did not reveal any significant differences between the three groups.

Comparison of the coefficients of correlation between playing ability and endurance for the three groups reveals that there is a significant difference in the magnitude of this relationship for mini and youth groups with mini boys



having a significantly higher relationship than youth boys. Other group differences however, have not been found significant. From the above findings it seems that there is some amount of general ability shared by playing ability and endurance for the mini group in comparison to youth group.

Since the difference in the relationship between playing ability and endurance for mini and youth groups is significant, the null hypothesis in this case is rejected. For the other differences, however, the null hypothesis is not been rejected

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