

# The Time Series Design Application of Clear Lob Basic Skill Mastery:

## An Analysis of the Functions of the Types of Goal Setting

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**Abstract**—This research was aimed at examining the affectivity of the types of goal setting as one of psychological skill training (PST) strategies in mastering clear lob basic skill (clear lob-BS) of badminton game. The research was conducted by administering quasi-experimental method and time series as the design of the study. The participants of the study were 60 beginner badminton student-athletes aged 10-12 years. The data were collected through the observation of clear lob-BS mastery instrument. The result of the analysis found that goal setting is effective to be used to accelerate the clear lob-BS mastery.

**Keywords:** *clear lob, goal setting, time series*

### I. INTRODUCTION

In a badminton game, besides high service and drop shot, another easiest and earliest basic skill that has to be taught is clear lob-BS [1]. Besides as the foundation to develop another type of basic skill, the mastery of clear lob-BS can be an initial barometer of a beginner badminton student-athlete ability and also develop the psychosocial aspect [2].

According to Thelwell & Greenless, there are four psychological strategy components that can be used to improve performance in sport, including mental imagery, self-talk, goal setting, and relaxation [3]. Goal setting is “a technique to determine the orientation of training goal that mobilizes individual behavior in achieving the goal [4], and plays an important role in affecting the psychological condition of a person, such as improving the motivation for learning and self-confidence, focusing attention on the important aspects of the task learnt, mobilizing efforts, improving persistence, and developing new strategies in learning [5]. In mastering the movement skill for the beginner student-athlete, goal setting becomes the key component of self-regulation learning [6,7]. It can be used during the training, starting from the observation stage, emulation stage, self-control stage, to the self-regulation stage [8,9].

Some research classify goal setting into the process goal, product goal, performance goal, dynamic or shifting goal, and multi-goal strategies [10-13]. Two of the five types of goal setting that are consistently effective to be used in improving learning and sport performance include process goal and dynamic goal [14]. Process goal is a type of goal setting that

focuses on the mastery and development of skill [15], while dynamic goal is a combination of product goal and process goal. Product goal itself is defined as a goal setting that focuses on the final outcome or the perfection of task in relation to social comparison [16].

The process goal is effective due to its function in focusing the students’ attention specifically to the key aspects of movement skill and the gradual effort to improve the accuracy of a movement skill [17]. Meanwhile, the dynamic goal is found to be effective as it has a function to deliver various competence information sources to the student-athletes that could complete and strengthen each other [18].

One of the theoretical perspectives that can be taken to justify this research is the mechanistic theory approach [5,19] which argues that the goal setting has the nature of direct mechanistic functions including directive, energetic, and persistent, and indirect mechanistic function of motivational functions that direct the student-athlete readiness to search, find, and use various knowledge and new strategies that are relevant to the task in hand.

Therefore, in relation to this research, the two types of the goal setting above are seemingly possible to be used as the psychological strategy to accelerate the mastery of clear lob-BS in badminton games by using the time series design. Because, although theoretically believed and proven effective in various research results, the facts show that the use of goal setting as a psychological strategy in sports activities is still limited, including in badminton game. Therefore, this research was aimed at examining the affectivity of the types of goal setting as one of PST strategies in mastering clear lob-BS of badminton game.

### II. METHODS

#### A. Participants

This research was conducted in The Badminton School of The Faculty of Sport and Health Education, Universitas Pendidikan Indonesia (UPI) involving 45 student-athletes of the Badminton Schools in Bandung, started from June-August 2019.

**B. Design of the Study**

This research was administered by employing the time series design in 24 meetings (3 times a week), for 2 months.

**C. Data Collection Instrument**

The instrument used in this study was the clear lob-BS learning outcome test that focuses on the process with subjective rating type [20], which was measured through personal observation on the preparation stage and implication stage dimensions, perception indicator, physical preparation, footwork movement preparation, racket preparation, racket movement, body movement, and footwork movement [14]. The observation was conducted in each training process by two observers and used three digital cameras. The items developed from each subsection of movement were formulated in the form of statement containing a more specific subsection of movement and can be observed by 9 behavior items and assessed by using the absolute rating with checklist type [20] in dichotomous scale 0-1.

**D. Data Analysis Technique.**

All of the obtained data were analyzed by using one predictor regression analysis, two-mean difference test, and split middle method to analyse the graphic direction tendency.

**III. RESULTS AND DISCUSSION**

**A. Results**

TABLE I. INTER-OBSERVER CORRELATION MATRIX

Clear Lob-BS based on the Process Goal Category			
	Observer 1	Observer 2	Observer CG
Observer_1	1.00		
Observer_2	.95	1.00	
Observer CG	.94	.96	1.00
Clear Lob-BS based on the Dynamic Goal Category			
	Observer 1	Observer 2	Observer CG
Observer 1	1.00		
Observer 2	.95	1.00	
Observer CG	.93	.89	1.00

Note: CG = Control Group

TABLE II. THE EQUATION MODEL OF PREDICTION REGRESSION OF CLEAR LOB-BS SCORE ATTAINMENT

Skill / Group	Clear Lob-BS				
	EM	PNS	NS1	NS2	T
Process GS	$\hat{Y}=11.82+2.16x$	$\pm 12 T$	270	540	1.6''
Dynamic GS	$\hat{Y}=23.34+1.69x$	$\pm 10 T$	230	460	3.1''
Combination GS	$\hat{Y}=16.41+1.91x$	$\pm 12 T$	270	540	1.9''
Control Group	$\hat{Y}=-1.39+1.07x$	$\pm 18 T$	360	720	.7''

Note: EM = Equation Model; PNS = Prediction of the Number of Shots; NS1= the Number of Shots in the First Chance; NS2 = the Number of Shots in the Second Chance; T = Time

TABLE III. THE PREDICTION OF CLEAR LOB-BS SCORE ATTAINMENT

a	b	x	$\hat{Y}$	Factual Score
11.82	2.16	1	13.98	11.23
11.82	2.16	3	18.31	17.60
11.82	2.16	6	24.80	24.81
11.82	2.16	9	31.29	29.63
11.82	2.16	12	37.78	41.29
11.82	2.16	15	44.27	51.05
11.82	2.16	18	50.76	53.10
11.82	2.16	21	57.24	52.42
11.82	2.16	24	63.73	61.01

Note: a = constant value; b = beta value; x = meeting;  $\hat{Y}$  = prediction of the obtained score in each meeting.

Table 1 presents the result of the inter-observer correlation analysis. It was found that the inter-observer correlation coefficient index was .89 to .96, .94 to .96 for the process goal and .89 to .95 for dynamic goal. As presented in table 2, it was found that the equation model of the regression line were  $\hat{Y} = 11.82 + 2.16x$  for the process goal,  $\hat{Y}=23.34+1.69x$  for the dynamic goal,  $\hat{Y}=16.41+1.91x$  for the combination goal, and  $\hat{Y}=-1.39+1.07x$  for the control group.

Furthermore, the prediction of the meeting in which the student-athlete could achieve the mastery level of clear lob-BS, was calculated based on the score gained in each meeting after observation compared to the prediction score based on the regression equation. Table 3 presents the sample of the result of measurement for clear lob-BS mastery by using the process goal intervention program.

According to the result of the analysis of regression equation model in table 2, some regression equation models to see the prediction score gained by the student-athlete in each meeting were found. The analysis result (table 3) shows that the score predicted in several meetings were varied and, based on the analysis, it was found that in the process goal (the regression equation was  $\hat{Y} = 11.82 + 2.16 x$ , the prediction of the number of meeting was  $\pm 12$  times, 270 shots), in the dynamic goal (the regression equation was  $\hat{Y}=23.34+1.69x$ , the prediction of the number of meeting was  $\pm 10$  times, 230 shots), in the combination goal (the regression model was  $\hat{Y}=16.41+1.91x$ , the prediction of the number of meeting was  $\pm 12$  times (270 shots), and in the control group (the regression equation was  $\hat{Y}=-1.39+1.07x$ , the prediction of the number of meeting was  $\pm 18$  times, 360 shots).

**B. Discussion**

The results of the analysis presented in the tables above present varied regression equation models in each group. It is relevant to the theoretical concept that the regression equation model can be calculated by using the  $\hat{Y} = a + bx$  formula, thus it can be assumed that the gained regression equation in each group can and will be used as the reference to predict the clear lob-BS mastery with x as the number of meeting or shots in the experiment activity, and the time required in doing shot skills transformed in the  $T = a / Pb$  formula [21,22]. T is the time used to finish a skill training, a and b are constant values that are obtained in the regression model, while P is the number of training conducted, including the number of shots in each meeting [21,22]. Furthermore, the prediction of the meeting

when the student-athlete could achieve the mastery level of clear lob-BS is predicted by the score calculation gained in each meeting after observation compared to the prediction score of the regression equation.

According to the result of analysis in table 2, it was found that clear lob-BS will be comprehended faster when the training process used the intervention of goal setting, especially the dynamic goal type. It was because dynamic goal is a hierarchical and pluralistic multipurpose strategy [14] related to the various competence information sources that complete and strengthen each other [18], the level of satisfaction and the complex feeling of success, the persistent involvement of the student-athlete of being actively engaged in each process of training [15], and gives information about the knowledge of performance and the knowledge of result as the external feedback that has a crucial role on sport performance as well as maintaining persistence and accumulation of psychosocial aspects of the student-athlete to keep being involved in learning activity or training [16,17,18]. Even, the result of the study of Locke & Latham [19] found that feedback is one of the main moderator variables for the affectivity of the goal setting intervention.

The result of the time calculation in the regression model application above, factually, shows that the more the repetitions in doing training, the time resulted in doing a movement will be shorter. It means that there is a negative relationship between the number of meetings in training, the number of repetitions in doing a movement, with the time resulted; the more the number of meetings and the number of training repetitions conducted, the shorter the time resulted [21,22]. However, the prediction of the mastery of clear lob-BS according to the regression equation model is still tentative since we still need to consider various variables influencing its consistence, such as the number of meetings per week, the number of shots in each training session, the number of time and participants, the number of trainers, the type of skill, and so on [14]. Further research is needed to be conducted, including the study in maintaining the quality of the observation process conducted, such as observer competence, visual device used, baseline measurement, and so on.

#### IV. CONCLUSION

According to the result of this study, it concludes that goal setting is effective to be used to accelerate the mastery of clear lob-BS. The learning outcome of the movement skill will be more effective when we focus on the key aspects of movement and when the learning process focuses on more than two types of goal setting.

#### REFERENCES

- [1] Y. Hidayat, & Sukadiyanto, "Instrumen strategi multiteknik mental atlet usia 11-13 tahun," *Jurnal Iptek Olahraga*, vol. 14(3), pp. 268-287, 2012, retrieved from: <https://dokumen.tips/documents/instrumen-strategi-multiteknik-mental-atlet-usia-11-13-tahun.html>.
- [2] Y. Hidayat, & D. Budiman, "The influence of self-talk on learning achievement and self confidence," *Asian Social Science*, vol. 10(5), pp. 186-193, 2014, retrieved from: <http://dx.doi.org/10.5539/ass.v10n5p186>.
- [3] R.C. Thelwell, & I.A. Greenlees, "Developing competitive endurance performance using mental skills training," *Sport Psychologist*, vol. 17, pp. 318-337, 2003, retrieved from: DOI: 10.1123/tsp.17.3.318.
- [4] Y. Hidayat, "The effect of goal setting and mental imagery intervention on badminton learning achievement motor skill at 10-12 years old: The context of Indonesia. EDUCARE," *International Journal For Educational Studies*, 2011, retrieved from: <http://www.journals.mindamas.com/index.php/educare/article/view/1124/1003>.
- [5] E.A. Locke, & G.P. Latham, "Building a practically useful theory of goal setting and task motivation," *American Psychologist*, vol. 57(9), pp. 705-717, 2002, retrieved from: doi: 10.1037//0003066X.57.9.705.
- [6] B.J. Zimmerman, & A. Kitsantas, "The hidden dimension of the personal competence. Self-regulated learning and practice," in *Handbook of competence and motivation*, A.J. Elliot & C. S. Dweck, Eds. New York: Guilford, 2005, pp. 509-526.
- [7] B.J. Zimmerman, "Investigating self-regulation and motivation: Historical background, methodological development, and future prospects," *American Educational Research Journal*, vol. 45(1), pp. 166-183, 2008, retrieved from: doi:10.3102/0002831207312909.
- [8] A. Kolovelonis, M. Goudas, M. Hassandra, & I. Dermitzaki, "Self regulated learning in physical education: Examining the effects of emulative and self-control practice," *Psychology of Sport and Exercise*, vol. 13, pp. 383-389, 2012, doi: 10.1016/j.psychsport.2012.01.005.
- [9] A. Kolovelonis, & M. Goudas, "The development of self-regulated learning of motor and sport skills in physical education," A. review. *Hellenic Journal of Psychology*, vol. 10, pp. 193-210, 2013, <https://www.researchgate.net/publication/261178554>.
- [10] B.J. Zimmerman, & A. Kitsantas, "Developmental phases in self-regulation: Shifting from process to outcome goals," *Journal of Educational Psychology*, vol. 89(1), pp. 29-36, 1997, retrieved from: [https://www.researchgate.net/profile/Barry\\_Zimmerman/publication/232582156](https://www.researchgate.net/profile/Barry_Zimmerman/publication/232582156).
- [11] D. Gould, "Goal setting for peak performance," in *Applied sport psychology*, J.M. Williams, Personal growth to peak performance. London: Mayfield Publishing Company, 2001, pp.158-169
- [12] R. Weinberg, "Making goals effective: A Promer for Coaches," *Journal of Sport Psychology in action*, vol. 1, pp. 57-65, 2010, retrieved from: doi: 10.1080/21520704.2010.513411.
- [13] R.H. Cox, *Sport psychology: Concept and application*, Iowa: Wm.C. Brown Publishers, 2015.
- [14] Y. Hidayat, "Pengaruh intervensi psikologis strategi multi-teknik (IPSM) terhadap hasil belajar keterampilan dasar bermain bulutangkis, motivasi olahraga, & kepercayaan diri," unpublished, Yogyakarta: Psikologi Universitas Gadjah Mada, 2016.
- [15] D. VandeWalle, W.L. Cron, & J.W.Jr. Slocun, "The role of goal orientation following performance feedback," *Journal of Applied Psychology*, vol. 86(4), pp. 629-640, 2001, retrieved from: doi: 10.1037//0021-9010.86.4.629.
- [16] D. Burton, & C. Weiss, "The fundamental goal concept: The path to process and performance success," in *Advances in sport psychology*, T. Horn Eds., Champaign, IL: Human Kinetics, 2008, pp. 340-475.
- [17] Y. Hidayat, "Pengaruh goal setting dan self-monitoring dalam penguasaan keterampilan gerak dan motivasi intrinsik siswa SD," *Cakrawala Pendidikan Jurnal Ilmiah Pendidikan*, vol. 31(3), pp. 495-511, 2012, retrieved from: doi: 10.21831/cp.v0i3.1554.
- [18] G.M. Steinberg, & M. Maurer, "Multiple goal strategy: Theoretical implication and practical approaches for motor skill instruction," *Journal of Physical Education, Recreation, & Dance*, vol. 70(2), pp. 61-65, 1999, retrieved from: doi: 10.1080/07303084.1999.10605667.
- [19] E.A. Locke, K.N. Show, L.M. Saari, & G.P. Latham, "Goal setting and task performance," *Psychological Bulletin*, vol. 90(1), pp. 125-152, 1981, retrieved from: doi: 10.7/0033-2909.90.1.125.
- [20] J.R. Morrow, A.W. Jackson, J.G. Disch, & D.P. Mood, *Measurement and evaluation in human performance*, 3rd Edn. Canada: Human Kinetics, 2005.
- [21] R. Lutan, *Belajar keterampilan motorik: Pengantar teori dan metode*, Jakarta: Depdikbud Direktorat Jenderal Pendidikan Tinggi Proyek Pengembangan Pendidikan Tenaga Kependidikan, 2005.

- [22] G. Matthews, R.D. Davies, J.S. Westerman, & R.B. Stammers, "Human Performance: Cognition, stress, and individual differences," Philadelphia: Taylor & Francis Group, 2000.
- [23] Duda, J.L. (1988). The relationship between goal perspectives, persistence and behavioral intensity among male and female recreational sport participants. *Leisure Sciences*, 10, 95-106. <https://www.tandfonline.com/doi/pdf/10.1080/01490408809512180>
- [24] Goudas, B., Theodorakis, Y., & Lapidis, K. (2007). The effect of external versus internal types of feedback and goal setting on endurance performance. *The Online Journal of Sport Psychology*, 9(3), 57-66. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.547.8873&rep=rep1&type=pdf>
- [25] Schmidt, R.A., & Lee, T.D. (2011). *Motor control and learning* (5th Ed.). Champaign, IL: Human Kinetics.
- [26] Magill, R.A. (2011). *Motor learning and control: Concepts and applications* (Eds. 9th). New York: Mc. Graw Hill
- [27] Locke, E.A., & Latham, G.P. (2006). New directions in goal setting theory. *Current Directions in Psychological Science*. 15 (5), 265-268 <https://journals.sagepub.com/doi/pdf/10.1111/j.1467-8721.2006.00449x>