International Education Studies; Vol. 9, No. 4; 2016
ISSN 1913-9020 E-ISSN 1913-9039
Published by Canadian Center of Science and Education

The Effectiveness of CBL Model to Improve Analytical Thinking Skills the Students of Sport Science

Elok Sudibyo[1], Budi Jatmiko[1] & Wahono Widodo[1]

[1] Universitas Negeri Surabaya, Indonesia

Correspondence: Elok Sudibyo, Universitas Negeri Surabaya, Indonesia. E-mail: elok.sudibyo@gmail.com

Received: September 10, 2015 Accepted: October 15, 2015 Online Published: March 29, 2016

doi:10.5539/ies.v9n4p195 URL: http://dx.doi.org/10.5539/ies.v9n4p195

Abstract

Sport science undergraduate education, one of which purposes is to produce an analyst in sport. However, generally analytical thinking skills of sport science's students is still relatively very low in the context of sport. This study aimed to describe the effectiveness of Physics Learning Model in Sport Context, Context Based Learning (CBL) model. The effectiveness of CBL model was described based on the data of increasing analytical thinking skills of sports science's students. This research used experimental design of pre-test and post-test design with replication. The results showed that the CBL model was able to improve the analytical thinking skills of sport science's students with N-gain of 0.78 in high category increase. Statistical paired t-tests also informed that the model can significantly improve analytical thinking skills of sport science's students at the level of significance as much as $\alpha = 0.05$. Based on the improvement of students' analytical thinking skills, it can be concluded the CBL model was effective.

Keywords: analytical thinking, context based learning, physics in sport context

1. Introduction

Physics is one of the main supporters of science that must be mastered by the students of sport science. This is consistent with the purpose of undergraduate sport science printed, which is prepared to be a sports scientist (researcher in sports) as an analyst (mechanical analysis), evaluator, or programmer in sport (Allyn, 2010; Commission for Discipline of Sport Science, 2000). For example, in a swimming competition, a swimmer is always trying to reach the finish line in the shortest possible time. In order to analysis the mechanical for the swimming sport, the students have to be able to determine the mechanical factors affecting the time of a swimmer while gliding and have understanding of the concepts of physics including mileage, average velocity, thrust (arms and legs), as well as the force of the water barrier (Guimaraes & Hay, 1985; Hay, 1993).

Based on research of Sudibyo et al. (2013), it showed that the students' capability in analyzing the mechanics of a sport activity was still relatively very low. It only reached mastery level of 3.24%. The ability to read a graph, compare the performance of athletes, and estimating were the abilities with top difficulty level and none of the students were able to answer correctly on the test items categorized such capabilities. Other capabilities including the indicator of the ability to conduct the mechanical analysis of sport and classified as very low were making a graph (3.75%), making the preparation of the data table (3.00%), and providing the explanation how to determine limb muscle power (1.25%).

The ability to analyze is included to high order thinking skills (Anderson & Krathwohl, 2001; Brookhart, 2010; Gronlund, 1996; Kemp et al., 1994). Learning approach that is appropriate for achieving learning outcomes with higher order thinking category, namely, "learning for transfer" that really noticed meaningful learning (Anderson & Krathwohl, 2001; Brookhart, 2010; D. Johnson & R. Johnson, 2002). The meaningful learning occurs when the students focus on relevant information and produce or construct various relationships (D. Johnson & R. Johnson, 2002; Woolfolk, 2009). Learning physics for sport science's students will be meaningful if it is associated to sports activities (contextual oriented). Therefore, it is necessary to implementation a Context-Based Learning (CBL) model. This model can be said to be specifically Physics Learning Model in Sports Context. In this model, the name of a sport or sport activity will be used as a way to discuss the concepts and laws of physics (especially mechanics).

Various research related to physics learning in the field of sports stated that the learning physics using examples of sports is more effective than conventional learning physics (Mroczkowski, 2009, 2012; Kadlowec & Navvab, 2012). In the conventional learning physics, a topic (concepts and laws) in physics is discussed coherently. The learning physics conventionally use *a bottom-up* approach, that is, basic skills gradually are formed into a part of a more complex abilities (Slavin, 2009). In contrast to bottom-up approach, the learning of physics using examples of sports activities are more emphasis on *top-down* approach (Slavin, 2009), by conducting the mechanical analysis (Mroczkowski, 2009, 2012). Huston (1999) generally provides an example of steps in the learning of physics applying the top-down approach. The steps include discussing examples of sports activities, identifying aspects of mechanics, discussing comprehensively the basics of mechanics, assigning individuals (in-depth learning of the particular sport interested by students each), constructing paper based on the result of study, and class presentations.

Various studies showed that the use of the proper context in learning can improve student’s motivation (McCullough, 2004; Whitelegg & Parry, 1999). The provision of contextual tasks can arouse students' intrinsic motivation (Santrock, 2008; Slavin, 2009; Woolfolk, 2010). Sudibyo et al. (2008) found that contextual learning can improve motivation and physics learning outcomes. Student's interest in a context can motivate students to learn a subject (Potter & Overton, 2006). The learning through context can enhance students' motivation to learn physics as well as the development of critical thinking skills and problem solving (Ng & Nguyen, 2006). Erman (2012) conducted a study about learning biochemistry through analysis of sports cases and it was proven that it can improve student’s literacy of sport-biochemistry.

The learning model can be said like a blueprint providing structure and direction for teachers to teach (Eggen & Kauchak, 2012). Gunter et al. (2010) defined learning model is as a step-by-step procedures guiding to the direction of specific learning outcomes. The learning models such as a recipe or blueprint, which presents the very specific and detail steps needed to achieve a learning outcome. In contrast to Gunter *et al.* (2010), Arends (2012) stated that a learning model should not be seen as a recipe that should be strictly followed for each case. The learning model is a guideline for teachers to think and talk about learning. In line with Arends (2012); Joyce et al. (2011) stated that the learning model is a description of a learning environment that also includes the behavior of teachers when implementing the model. Based on the various definitions of learning model above, the learning model can be defined as *guidelines that guide the lectures in providing learning experience for the students and describe the environment and the lecture’s behavior when implementing it.* The learning model should have a solid theoretical basis explaining why someone should use that model to achieve the goals that have been designed, and has a structure or steps that must be done by the lecturers and students in learning (Arends, 2012; Eggen & Kauchak, 2012; Gunter et al., 2010; Joyce et al., 2011).

2. Research Method

The effectiveness of CBL model to improve analytical thinking skills the students of sport science. For looking at the consistancy of CBL model, this research employed an experimental design of pre-test and post-test design (Fraenkel & Wallen, 2003) with replication presented in Figure 1.

Grouping Sport Science’s Students of State University of Malang (UM)			
Class A	O_1	X	O_2
Class B	O_1	X	O_2
Grouping Sport Science’s Students of State University of Surabaya (Unesa)			
Class C	O_1	X	O_2
Class D	O_1	X	O_2

Note: O_1 = pretest; O_2 = posttest; X = treatment

Figure 1. Experimental design of pretest and posttest design with replication

The treatment mentioned in the Figure 1 was learning activities, implementing the model, with the steps showed in Figure 2.

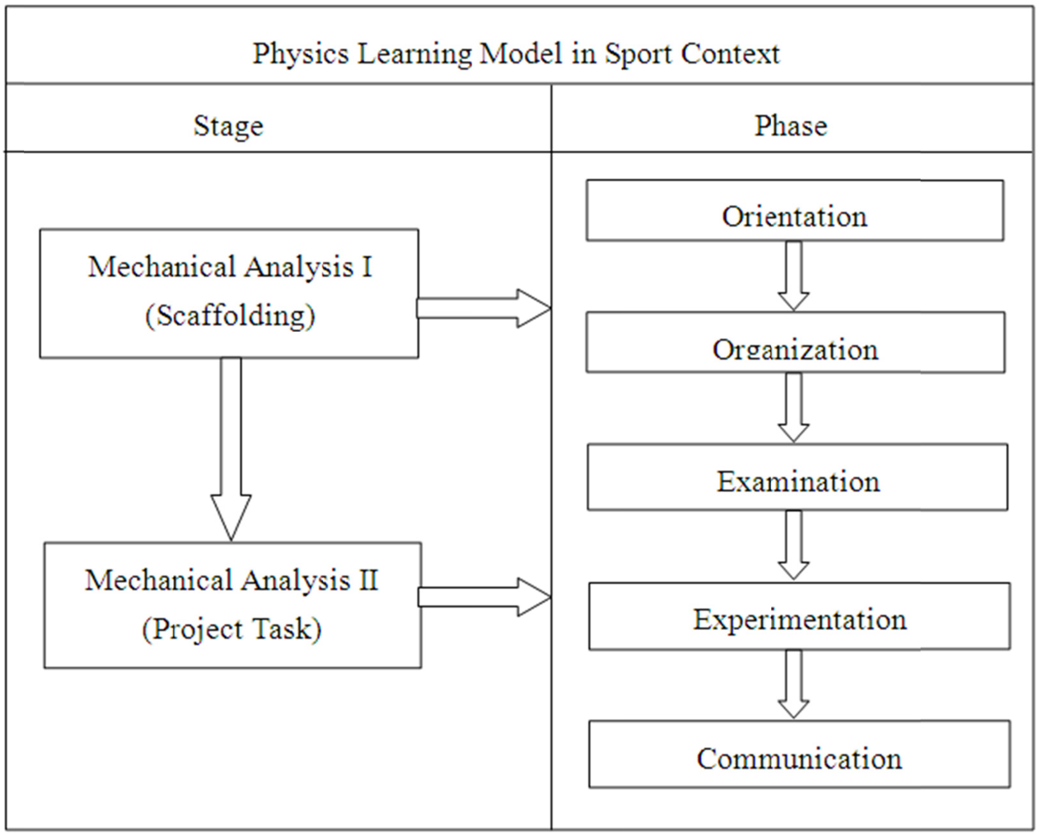

Figure 2. The chart of CBL model

The explanation of each model phase presented in Table 1.

Table 1. Syntax of the CBL model

Phase	Description
Orientation	Orienting students into sport context and its problem.
Organization	Organizing students and/or information about physics in sports.
Examination	Examining comprehensively concepts and laws of physics in sports.
Experimentation	Designing and implementing investigation in real condition or virtually
Communication	Communicating the result of examination and/or investigation.

The analytical thinking skills of sport science's students was measured using an instrument, namely, "Analytical Thinking Skills Test (ATST)." The items of the tests were formed into essay question with reference to the aspects of analytical thinking skills. The Assessment to the students' answers when the tests were carried out is the data describing the level of students' analytical thinking skills. To determine the impact of the of the CBL model implementation, it was necessary to conduct pre-test and post-test. Description of the results of the pre-test is conducted to determine the prior ability of the student before treatment while the description of the results of the post-test is conducted to determine the ability of the student after the treatment. The effectiveness of the CBL model examined based on the normalized gain or N-gain (Hake, 2002) between the pre-test and post-test on the ATST.

Formulation of N-gain according to Hake (2002), that is:

$$< g > = \frac{\%\, actualgain}{\%\, potentialgain} = \frac{\%\, posttestscore - \%\, pretestscore}{100 - \%\, pretestscore}$$

Furthermore, it was descriptively analyzed of N-gain using N-gain criterion according to Hake (1999), namely: (1) learning outcomes with "high gain" if $<g> \geq 0.7$; (2) learning outcomes with the "medium gain" if $0.7 < <g> \leq 0.3$; and (3) the learning outcome with "low gain" if $<g> <0.3$. Generally, the use of N-gain is employed to determine the category of improvement of student's analytical thinking skills whether they are categorized into high, medium, or low increase.

In addition to the descriptive analysis used N-gain, paired t-test was employed to determine the significance of analytical thinking skills increase. Data analysis technique of paired t-test was conducted using a software, namely, Statistical Package for Social Sciences (SPSS). The SPSS software was chosen as a tool to analyze the data in this study because the program has a fairly high analytical ability, a data management system and is able to operate quite simple (Ali, 2010). Before the researchers used this data analysis technique, there is a requirement that must be fulfilled, so that the researchers are allowed to use the analysis technique, namely data normality test (Arikunto, 2010). Testing normality of the data was used Kolmogorov-Smirnov test (Yamin, 2014). Testing normality of the data also employed the SPSS software.

3. Results

The description related to the improvement of student's analytical thinking skill was carried out in two ways, namely using N-gain and paired t-test. The use of N-gain was intended to determine the category of increase of analytical thinking skills, while the use of paired t-test was concerned to determine the significance of the increase.

3.1 Analytical Thinking Skills Improvement Categories

The categorization of student's analytical thinking skills improvement was conducted using the N-gain (Hake, 1999). According to Hake (1999), the categorization can be grouped into three categories, namely an increase in the high category (H), medium (M), and low (L), each of which depends on the value of N-gain achieved. Data of student's analytical thinking skills improvement based on the aspects presented in Table 2.

Table 2. The improvement of student's analytical thinking skill

Aspects of Analytical Thinking Skill	Average Pretest	Average Posttest	Average N-Gain	Category
Differentiating	2.11	71.00	0.70	High
Organizing	11.14	83.31	0.81	High
Attributing	13.49	84.68	0.82	High
Average	8.27	79.76	0.78	High

The Table 2 describes that the average increase of student's analytical thinking skills is 78% (score of N-Gain is 0.78). Based on the criteria according to Hake (1999), N-Gain of 0.78 are included in the category of high increase. Thus, the result has indicated that the CBL model was effective to improve the student's analytical thinking skills.

The average increase (N-Gain) of analytical thinking skills of 78% was an average of four participant classes and the average achievement of each indicator and aspect of analytical thinking skills. In the visualization, in order to more easily compare the increase of analytical thinking skills for each class, the following is presented a bar chart as shown in Figure 3.

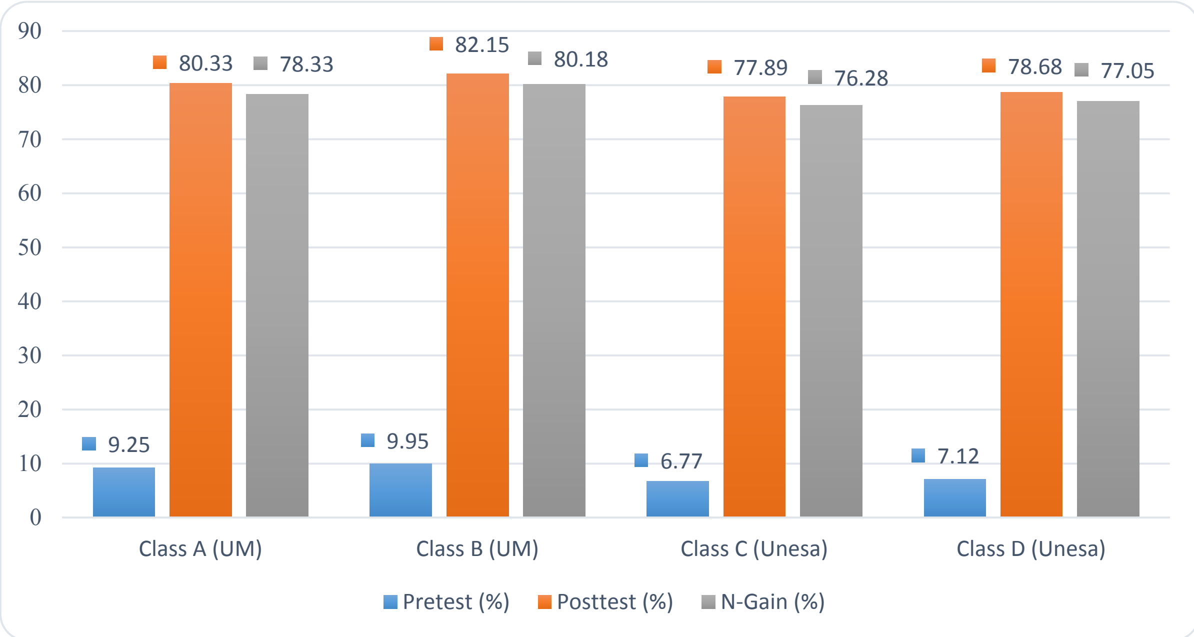

Figure 3. N-Gain score of analytical thinking skills for each class

The Figure 3 illustrates that generally analytical thinking skill of the sports sciences' students have improved with a high improvement category. The bar chart also show that the N-Gain score of each class has increased which is proportional to the level of analytical thinking skills. The improvement of student's analytical thinking skills in four classes was more than 70% categorized into high increase category. This indicates that the CBL model that are being developed can be applied to all four classes effectively.

3.2 Significance of Analytical Thinking Skills Improvement

In order to determine the significance of the increase of analytical thinking skills among the results of pretest and posttest, it is necessary to test the average difference using paired t-test (Wibisono, 2009). The hypothesis that was tested is the null hypothesis (H_0) which states that there is no increase in student's analytical thinking skills between the results of pre-test and post-test, while the alternative hypothesis (H_1) states that there is an increase in student's analytical thinking skills between the results of pre-test and post-test; at the significance level (α) set out in this study was 0.05. Testing the average difference using paired t-test was conducted using SPSS. Criteria for rejection of H_0 was that if the significance (2-tailed) or p-value of paired t-test is less than 0.05 (Yamin, 2014).

A requirement for using paired t-test is that the data should be normally distributed. Normality test of data was intended to show that the data sample is obtained from a normal distributed population. Hypotheses for testing the normality is illustrated as H_0 (the data follows a normal distribution function) and H_1 (the data do not follow a normal distribution function). Statistical analyzes used to test the normality of the data is the Kolmogorov-Smirnov test. If H_0 is received, it means that the data follow a normal distribution function. It will be occurred if the significance value of p-value is greater than 0.05 (Yamin, 2014). Testing the normality of the data also used SPSS. Results of the normality test with SPSS are presented in Table 3.

Table 3. Normality test of analytical thinking skills data using the Kolmogorov-Smirnov test

University	Statistic	df	Significance	Description
State University of Malang	0.074	80	0.200	Normal
State University of Surabaya	0.095	71	0.200	Normal

The Table 3 describes that the results of normality test was obtained *p-value* for State University of Malang and Surabaya as much as 0.200 and 0.200 (>0.05) respectively. Due to the significant value was more than 0.05, so that H_0 was accepted. It means that the data followed a normal distribution function. Because the requirement is fulfilled, the testing of the average difference between the results of the pre-test and post-test using the paired t-test can be carried out.

The paired t-test was used to determine whether there is an increased analytical thinking skill significantly between the pretest and posttest. The significance of the increase between the results of the pretest and posttest represented the positive impact significantly coming from the implementation of the CBL model. The paired t-test results are presented in Table 4. As has been written previously that the criteria of H_0 rejection is that if the significance (2-tailed) or p-value of paired t-test is less than 0.05. If H_0 there is no increase in analytical thinking skills is rejected, H_1 (there is increase in analytical thinking skills) is accepted.

Table 4. Results of paired t-test between pretest and posttest of analytical thinking skills for each class

Class	t	df	Sig. (*2-tailed*)	Description
A	41.559	39	0.000	H_0 is rejected
B	63.695	39	0.000	H_0 is rejected
C	49.009	35	0.000	H_0 is rejected
D	42.387	34	0.000	H_0 is rejected

The Table 4 informs that the significance (2-tailed) or p-value of t-test statistics for all paires (pretest and posttest) on Class A, B, C, and D was 0.000 (<0.05). Value of significance (2-tailed) for Class A, B, C, and D are 0.000 (<0.05). Thus, H_0, which states that there is no increase in analytical thinking skills, was rejected. Because H_0 was rejected, then H_1, which states that there is an increase in analytical thinking skills, was accepted.

Based on the test results of the average difference between the pretest and posttest using paired t-test as shown in Table 4, the implementation of CBL model can improve analytical thinking skills of sport sciences' students significantly, at $\alpha = 0.05$. The Table 4 also informs that increased significantly analytical thinking skills occured in both State University of Malang (Class A and B) and State University of Surabaya (Class C and D).

4. Discussion

Based on the data presented in the Table 2, it indicates that the level of student's analytical thinking skills at the pretest reached only 8.27%, but the level of student's analytical thinking skills reached 79.76% at the posttest. Based on the N-gain, generally the analytical thinking skills of sport sciences' students has increased by 0.78 with a high improvement category. Also, based on the data presented in Table 4, it also shows that the analytical thinking skills of sport sciences' students have increased significantly. Therefore, the implementation of CBL model can be said that the model is effective to improve the analytical thinking skills of sport sciences' students.

Analytical thinking skills is high order thinking skills (Anderson & Krathwohl, 2001; Brookhart, 2010; Gronlund, 1996; Kemp, 1994). Learning approach that is appropriate to achieve the learning outcomes categorized into high order thinking is learning for transfer being really paying attention to "meaningful learning" (Anderson & Krathwohl, 2001; Brookhart, 2010; D. Johnson & R. Johnson, 2002). According to Slavin (2009), meaningful learning occurs when a new information into the mind associated with prior knowledge. To ensure a meaningful learning, it is required a proper context for learners. Research of Raub et al. (2015) found that the implementation of contextual learning is able to increase the higher order thinking skills. The implementation of CBL model is a meaningful learning for sport sciences' students. Sport activities are the proper context for the sports sciences' students. This is in line with schema theory which states that when a person reconstruct the information, the person adapt to the prior knowledge that already exists in his mind (Santrock, 2008).

In addition, one of the learning theories that emphasizes the importance of meaningful learning is constructivist theory which states that learners should find and transform complex information if they want the information to be their own, by considering new information against old rules and changing the rules when they no longer useful (Slavin, 2009). Focusing on the constructivist theory, the role of lecturers in learning is only as a facilitator. The physics lecturing applying the CBL model emphasized that the students should actively *construct* their own knowledge and understanding. To construct meaningful and relevant information for the students, the lecturers have to give an opportunity to the students to find or implement their own ideas, and consciously implement their own strategies for learning. Thus, the achievement of learning outcomes related to the analytical thinking skills are basically supported by a rational theoretical foundation.

If it is considered the pretest data presented in the Table 2, it can be said that the analytical thinking skills of sport sciences' students was still very low with the percentage of 8.27. Achievement of the value is still below the minimum limit of mastery (65.00%). If the data of pretest result was seen (presented in the Table 2), all the aspects of analytical thinking skills were still classified in the category of unmastered. The results were in line with the results of pilot project that have been conducted before (Sudibyo et al., 2013), which also shows that the analytical thinking skills of sport sciences' students was still relatively very low with the percentage of 3.24. This phenomenon is one of causes of the low number of students' research associated with motion analysis. Research of Sudibyo et al. (2012) showed that Unesa sport sciences' students who conduct research related to motion analysis is still very low in terms of quality, which is only amounted to 5.02. This is certainly very contradiction with the goal of education for graduate candidates of sport science, which is prepared to be a sports scientist (researcher in sports), especially as an analyst in the sports (Allyn 2010; Commission for Sport Science Discipline, 2000).

Based on the data presented in the Table 2 also depicts that generally the analytical thinking skills of sport sciences' students has increased by 71.49, from 8.27 to 79.76. When used the normalized increase (N-gain), the increase in analytical thinking skills of the sport sciences' students was equal to 0.78. According to Hake (1999), in general the increase has been classified in the high category. The data of analytical thinking skills improvement according to Hake (1999) was also in accordance with the results of statistical analysis using paired t-test (Wibisono, 2009). Based on the test results of the average difference between the pretest and posttest using paired t-test as shown in the Table 4, it was found that the implementation of the CBL model can improve the analytical thinking skills of sports sciences' students significantly, at $\alpha = 0.05$. Thus, based on the improvement of students' analytical thinking skills, it can be said the CBL model was effective. The result is in line with research of Ng and Nguyen (2006). It shows that learning through the context is able to develop critical thinking skills and problem solving. According Facione (1990), the analytical thinking is one of critical thinking skills dimensions.

Moreover, there is one finding that was a positive aspect, namely the increase of analytical thinking skills carried out at the four classes, namely Class A, B, C, and D. The Class A and B were the participant coming from State University of Malang, where as the Class C and D were from State University of Surabaya. This indicates that the CBL model was consistently able to be implemented in the two state universities in East Java and also showed effective results to improve the analytical thinking skills of sports sciences' students.

5. Conclusion and Recommendations

5.1 Conclusion

Based on the above results there are several conclusions can be drawn such as:

1) The Physics Learning Model in Sports Context (CBL model) is able to improve effectively the analytical thinking skills of sports sciences' students. The improvement of analytical thinking skills has increased with N-gain of 0.78 categorized into high level category.
2) Based on the results of paired t-test showed that the analytical thinking skills of sport sciences' students has increased significantly with $\alpha = 0.05$ after they got a learning that implements the Physics Learning Model in Sports Context (CBL model).

5.2 Recommendations

In consideration on the findings above, the suggestions can be proposed by the researchers such as:

1) This study was carried out only in two state universities in East Java, namely State University of Malang and State University of Surabaya. Therefore, to examine the consistance of the CBL model, it is necessary to conduct further research with more extensive participant.
2) The CBL model is needed to be implemented to other subjects, even students of other study programs.
3) Although the learning implemented the CBL model, the learning emphasized top-down approach, through sports analysis. On the other hand, it is also necessary to be developed physics reference containing physics topics systematically based on the science of physics. In contrast to the references of physics generally, physics learning material in the references should be specific to the sports sciences' students. This reference is required of students when they are in the examining phase (Phase 3) of CBL model.

References

Ali, M. (2010). *Methodology and Application of Education research*. Bandung: The Main Scholarly Literature.

Allyn, D. A. (2010). Capstone Project: Student Learner Outcomes. *Symposium on Teaching Biomechanics*. University of Wisconsin-River Falls (UWRF).

Anderson, L. W., & Krathwohl, D. R. (2001). *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*. New York: Longman.

Arends, R. I. (2012). *Learning to Teach* (9th ed.). New York: McGraw-Hill.

Arikunto, S. (2010). *Research Procedure, a Practice Approach*. Jakarta: Create of Rineka.

Brookhart, S. M. (2010). *How to Assess Higher-Order Thinking Skills in Your Classroom*. Alexandria: ASCD.

Commission for Discipline of Sport Science. (2000). *Sport Science and the Development*. Jakarta: Ministry of National Education.

Eggen, P., & Kauchak, D. (2012). *Strategies and Models for Teachers: Teaching Content and Thinking Skills* (6th ed.). Boston: Pearson Education.

Erman. (2012). *Learning Biochemistry through Sports Problems Analysis to Improve Literacy of Sport-Biochemistry of Sport Sciences' Students* (Dissertation, University of Indonesian Education).

Facione, P. A. (1990). *Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction. Executive Summary "The Delphi Report."* California: California Academic Press.

Fraenkel, J. R., & Wallen, N. E. (2003). *How to Design and Evaluate Research in Education* (5th ed.). New York: McGraw-Hill.

Gronlund, N. E. (1996). *How to Write and Use Instructional Objectives* (5th ed.). New Jersey: Merrill.

Guimaraes, A. C. S., & Hay, J. G. (1985). A Mechanical Analysis of the Grab Starting Technique in Swimming. *International Journal of Sport Biomechanics, 1*, 25-35.

Gunter, M. A., Estes, T. H., & Mintz, S. L. (2010). *Instruction A Models Approach* (5th ed.). Boston: Pearson Education.

Hake, R. R. (1999). *Analyzing Change/Gain Score. American Educational Association's Division D, Measurement and Research Methodology.*

Hake, R. R. (2002). *Relationship of Individual Student Normalized Learning Gains in Mechanics with Gender, High-School Physics, and Pretest Scores on Mathematics and Spatial Visualization*.

Hay, J. G. (1993). *The Biomechanics of Sports Techniques* (4th ed.). New Jersey: Prentice Hall.

Huston, R. L. (1999). What I Learned in 25 Years of Teaching Introductory Biomechanics. *Int. J. Engng Ed., 15*(4), 240-242,.

Johnson, D. W., & Johnson, R. T. (2002). *Meaningful Assessment, A Manageable and Cooperative Process*. Boston: Allyn and Bacon.

Joyce, B., Weil, M., & Calhoun, E. (2011). *Models of Teaching* (8th ed.). New Jersey: Pearson Education.

Kadlowec, J. A., & Navvab, A. (2012). Using Sports in Engineering to Teach Mechanics of Materials. *Global Journal of Engineering Education, 14*(1).

Kemp, J. E., Morrison, G. R., & Ross, S. M. (1994). *Designing Effective Instruction*. New York: Macmillan College Publishing Company, Inc.

McCullough, L. (2004). Gender, Context, and Physics Assessment. *Journal of International Women's Studies, 5*(4).

Mroczkowski, A. (2009). The Use of Biomechanics in Teaching Aikido. *Human Movement, 10*(1), 31-34. http://dx.doi.org/10.2478/v10038-009-0002-6

Mroczkowski, A. (2012). *Using the Knowledge of Biomechanics in Teaching Aikido* (Chapter 3, Licensee InTech). http://dx.doi.org/10.5772/49955

Ng, W., & Nguyen, V. T. (2006). Investigating the Integration of Everyday Phenomena and Practical Work in Physics Teaching in Vietnamese High Schools. *International Education Journal, 7*(1), 36-50.

Potter, N. M., & Overton, T. L. (2006). Chemistry in Sport: Context-Based e-Learning in Chemistry. *Chemistry Education Research and Practice, 7*(3), 195-202. http://dx.doi.org/10.1039/B6RP90008A

Raub, L. A., Shukor, N. A., Arshad, M. Y., & Rosli, M. S. (2015). An Integrated Model to Implement Contextual

Learning with Virtual Learning Environment for Promoting Higher Order Thinking Skills in Malaysian Secondary Schools. *International Education Studies, 8*(13), 41-46. http://dx.doi.org/10.5539/ies.v8n13p41

Santrock, J. W. (2008). *Educational Psychology* (3rd ed.). Boston: McGraw-Hill.

Slavin, R. E. (2009). *Educational Psychology Theory and Practice* (9th ed.). New Jersey: Pearson Education.

Sudibyo, E., Anisjak, I. N., & Iksan, M. (2008). Implementation of Contextual Learning to Improve Motivation and Learning Outcome of Students in Junior High School 3 Porong. *Basic Education Journal, 9*(1), 7-15.

Sudibyo, E., Jatmiko, B., & Widodo, W. (2012). Study about the Various of Sport Science Students' Thesis Categorizing Motion Analysis. *Sport Science Journal, 7*(1), 32-39.

Sudibyo, E., Jatmiko, B., & Widodo, W. (2013). The Ability of Sport Science Students Unesa for Analyzing Sport Mechanical. *Sport Science Journal,* 8(1).

Whitelegg, E., & Parry, M. (1999). Real-Life Contexts for Learning Physics: Meanings, Issues and Practice. *Journal of Physics Education, 34*(2).

Wibisono, Y. (2009). *Statistic Method*. Yogyakarta: University Press of Gadjah Mada.

Woolfolk, A. (2009). *Educational Psychology, Active Learning Edition* (10th ed.). New Jersey: Pearson Education.

Woolfolk, A. (2010). *Educational Psychology, Global Edition* (11th ed.). New Jersey: Pearson Education.

Yamin, S., & Kurniawan, H. (2014). *SPSS Complete, the Most Complete Statistical Analysis Technique with SPSS Software* (2nd ed.). Jakarta: Technology Information of Salemba.