

The Development Model of Training Techniques Shot Put O'Brien Style Based Biomechanical Studies

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Abstract— The purpose of this study is to know what students do, including basic techniques, glide, final stage, task, and repulsion performance. The research method used is Research and Development approach. Samples used in this study are students of vocational high School Kalijambe grade X TKR. Therefore, it is necessary to develop a learning media in accordance with O'Brien's style based on biomechanical studies. The draft model is ready to be reviewed by a multimedia expert and O'Brien style expert to get product validity. Based on the results of the final score calculation of the final test, it indicates a larger factor for the model provided by the exercise developed by the researcher. The use of style-based learning biomechanics on the O'Brien learning style can be effectively used.

Keywords— shot-put, o'brien style, biomechanic.

I. INTRODUCTION

The trend of using social media becomes a must for adolescents to follow it, so it is not surprising with the number of television programs and the proliferation of television stations make the children more enjoy to sit in front of the television and play mobile phones. The existence of the changes above is an important signal to look for alternative solutions. From such conditions, finally educational practitioners think hard to formulate a new paradigm in education. Implementation of full day school is one alternative to overcome various problems of education, both in achievement and in terms of morals or morals. By attending full day school, parents can prevent and neutralize the likelihood of children's activities plundering on negative activities. One of the reasons parents choose and put their children into full day school is in terms of student education (Bahrudin, 2010: 230)

Physical education is part of education as a whole. According to Aip Syarifudin, et al "Physical education is a process through physical activity, designed and arranged systematically to stimulate growth and development, improve the ability and skills of the body, intelligence and character formation, and value and positive for every citizen to achieve educational goals" [13].

The purpose of physical education is the education of the child as a whole, to develop the individual child optimally which includes physical, mental, moral, social, aesthetic, emotional, intellectual and health changes [7] . The Physical

Education is a process of education that utilizes physical activity and is planned systematically aimed at increasing individuals organically, neuromuscularly, perceptually, cognitively, socially and emotionally.

Schools other than as formal educational institutions, can also serve as a place of development and sports coaching. Evidenced by the inclusion of athletic sports into the school curriculum, from elementary school to vocational high School provide a positive impact in the world of education, in the development of athletic sports into a popular sport in Indonesia, especially on the throwing numbers, Indonesian athlete Eki Febri Ekawati won medals gold SEA Games 2017 at Bukit Jalil Stadium, Kuala Lumpur, Malaysia, from a shot put with O'Brien style with 15.39 meters repulsion performance. This extraordinary achievement of course requires hard training. Learn about the O'Brien style starting force from the ground level. At this stage, as a core exercise students learn basic engineering movements. Basic motion exercises or basic techniques of the O'Brien style, students must understand movement techniques properly and correctly so that students must really understand the basic techniques and concepts. Mastery of good basic techniques will provide an optimum blast effect. To be able to master good basic engineering skills requires regular and thorough training. Exercise can be done at school according to the curriculum applied in school. Given the limitations of school hours and the considerable curriculum content of the lesson, the exercises can be done on self-development activities outside the learning hours. In addition, training can also be done at home or at other places at any time and every opportunity. Because this basic technique training technique, the o'brien style requires accuracy in both techniques and trajectories, there needs to be guidance, direction and monitoring from teachers, instructors or trainers. The problem that then arises is, first the limitations of face to face does not allow teachers to monitor continuously the development of students' abilities, the second is the absence of practical learning media for the competence of the shot hit. The concept of learning that is currently being developed is active, initiative, creative, effective and fun learning. Of course this requires that the concept developed can foster student involvement. So without realizing directly by the students turns out students have been involved in a deep and deep in the learning process.

Many factors that affect student learning outcomes, one of which is a problem in learning activities. The causes of learning problems can be sourced from internal and external factors such as student motivation and enthusiasm of learning materials. While external factors include the family and the surrounding environment that can be teachers, environment, materials, media and methods used by teachers. Lack of student participation in following the lesson will reduce the success rate of students in learning. Therefore it is necessary to take action that is able to involve the active role of students in following the learning to achieve the learning objectives, the development of model of basic technique skills exercise based on O'Brien biomechanics study is expected to be one alternative to improve student achievement and learning outcomes. In addition, there is an increase in the number of students who participate in the learning both in the classroom and in extracurricular activities held in schools as well as groups of athletic associations outside school.

II. METHOD

This research method using Research and Development approach. While the selected research development model is an educational research and development model developed by Borg and Gall. Educational research and development (R & D) is a process used to develop and validate educational production [4]. In that sense, the series of steps of research and development is carried out cyclically, and at every a step that will pass or do always refer to the results of previous steps until eventually obtained an educational products

As described in the previous discussion of research model development Borg and Gall covers ten steps as follows: 1). Preliminary Study, 2). Planning research, 3). The development of the initial product, 4). The field trials early (limited), 5). Revision field test results is limited, 6). field test broader, 7). Revision field test results, 8). test the feasibility , 9). Revised results of due diligence, 10) dissemination and socialization of the final product. The design of skills model based on biomechanical study involves several elements of the developer of personnel who served as the designer of content / material, video takers, images and computer programming experts. The expert sources involved in designing and manufacturing this research product are product designers, O'Brien style experts, video takers, images, image editors, video editors, script makers, and computer programming experts. The production of the product remains in the control of the researcher as the principal product designer so that the expert resource involved only acts as a technical and consultant.

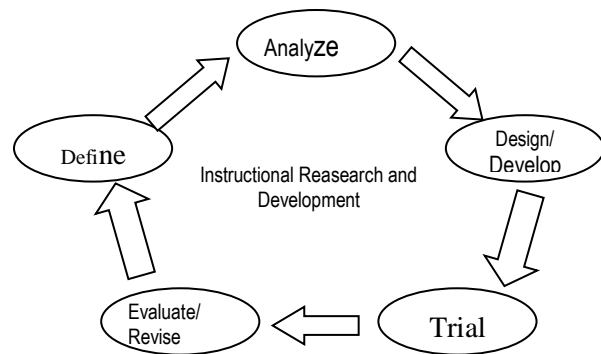


Fig. 1. Model Development Cycle Borg and Gall(1989:782)

Qualitative analysis relies on observations by the coach or the motion analyst either directly or through video recording. This corresponds to the nature of qualitative research in which researchers (trainers, analyst) is the main instrument. Although it emphasizes the role of analysts of motion, approach Qualitative analysis still uses tools in the form of software to analyze motion. The difference, in qualitative analysis the focus is the pattern, not the quantification of the data. If analysis quantitative methods are generally performed by researchers, qualitative analysis is more appropriate for teachers, trainers, physiotherapist, and artistic sports jury [3]. Video taking is captured using the 8x 5.0 -40.0 mm canon ixus zoom lens which is positioned at the diagonal level of the platform at a distance of 3 m from the movement of the shot-put Obrien style, and analyzed its biomechanics using kinovea software and software skysoft.

III. RESULT AND DISCUSSION

A. Result

Preliminary stage in this research is the analysis of the need to identify the problem, in this study needs analysis done using the facilities through the online questionnaire distributed via facebook account. There were 40 respondents who responded with 97.4% of whom were teachers / lecturers PE. The following detailed data questionnaire count results.

Expert evaluation used in this study used 3 experts with different background of ability, that is 1 multimedia expert, 1 expert of O'Brien and 1 expert in both field that is multimedia and shot put.

With quantitative data quantity assessment or expert test with a score of 78.24, then based on the criteria of eligibility level according to Arikunto (2009: 44) can be interpreted that the product design development model of basic technique skills training Rejects O'Brien based biomechanics review can be tested at a later stage [1]. Comparative mastery of the basic technique of start-up O'Brien style force based on the difference in final test score minus the initial test in the experimental group and the control group. Test the normality of population frequency distribution. Before doing the data analysis need to be tested the distribution of kenormlalannya. Test the normality of data in this study using Lilliefors method. The Lilliefors test is used when the sample size (n) is less than 30 [14]. Suppose a random sample with

observations: x_1, x_2, \dots, x_n . Will be tested whether the sample comes from a normal distributed population or not.

The model product of basic technique training techniques of O'Brien's integrated bullet-wielding force in the learning media based on the O'Brien-style O'Brien-style biomechanical study developed by the researcher can improve the basic technique skill of start-up style at O'Brien level at SMK Negeri 1 Kalijambe effectively.

TABLE 3.1. Conclusions Quantitative Data Evaluation Expert

No	Basic Technique	Experiment Group	Control Group
1	Prefix	22,0 %	5,0 %
2	Glide	24,0 %	19,0 %
3	Final stage	17,0 %	6,0 %
4	Repulsive	25,0 %	17,0 %
5	Move up	18,0 %	6,0 %
6	Repulsive Achievement	16,0 %	2,0 %

TABLE 3.2. Comparison of Basic Technique Capability Improvement Basic O'Brien style shot put at the Experiment Group and Control Group

No.	Evaluation Aspects	Skor	Skor Maks	Results %
1	Multimedia Experts	30	40	75,00
2	Practitioner Expert O'Brien style	23	30	76,67
3	Expert Multimedia and shot put	53	65	83,07
Jumlah		106	135	78,24



Fig. 2. Model of Basic Technique Skills Training Shot-Put Obrien Style Based Biomechanics Review

B. Discussion

Biomechanics as a new term / word popular in the 1960s. The history of biomechanics itself is part of the history of kinesiology (the science of human motion) which began to be used in the late 19th century. The book, titled *Scientific Principles of Coaching* by John Bunn published in 1955, is the first text to emphasize the mechanical aspects of sports movement. In the previous period, the discussion of sports movement more emphasized aspects of anatomy. The next development, in 1967, was held the first international biomechanics seminar in Zurich, Switzerland. A year later the *Journal of Biomechanics* for the first time was published. Several papers in it raised the topic of sports biomechanics. From an institutional standpoint, the American Society of Biomechanics was born in 1977 and in the early 1980s the International Society of Biomechanics was established [10]. The factors that influence intrinsic motivation are, Needs A person performs activities due to the presence of both biological and psychological needs factors, Hopeancy A person is motivated by success the hope of success is self-gratification, success and self-esteem increases and moves a person towards the achievement of goals [5]. Interest Interests is a sense of preference and a sense of desire for something anpa somebody tells. Based on the above understanding, it can be concluded that intrinsic motivation is a motivation that requires stimulation or encouragement from within individuals. Biomechanics can be interpreted as a study that uses the concept of mechanics and machines to express human motion efficiently [12]. The definition provides an illustration that sports biomechanics can be interpreted as a science that studies the internal and external forces acting on the human body as well as the effect that the force generates on sports activities.

The research was conducted on November 27, 2017 until March 29, 2018. Furthermore, the object is the vocational high school students Kalijambe Sragen, Sragen regency. This research uses R & D development research method developed by Borg and Gall. Borg and Gall's model development research includes the following ten steps: 1). Study Introduction, 2). Research planning, 3). Initial product development, 4). Initial (limited) field trials, 5). Revision of field test results is limited, 6). Wider field test, 7). Revision of field test results, 8). Feasibility test, 9). Revision of feasibility test results, 10) Dissemination and socialization of the final product. This research is also called 'research based development', which emerges as a strategy and aims to improve the quality of education. The population of this study involved students SMK N 1 Kalijambe, Sragen owned with a total of 528 students. Maksum states "random sampling is a sampling technique that provides equal opportunities for individuals who become members of the population to be elected as a sample member" [9]. Furthermore, a random sampling method is used to select samples in between population.

In this study sampling as a research subject is a student class X TKR, then taken at random without choose according to the levels and the age limit. The number of samples taken in

this study were 31 male students from a total of 204 students. Details of the sample in this development study are as follows: (1). Test small group using 6 samples. (2). Large group tests used 12 samples. (3). Product effectiveness test: the experimental group used 12 samples, the control group used 12 samples.

Data analysis techniques in this study using data analysis techniques descriptive. The descriptive analysis is used to analyze the data in a way describe or describe the data that has been collected as is without the intention of making conclusions that apply to the public or generalization [15]. In this study used two kinds of descriptive data analysis techniques which will be done, that is descriptive qualitative data analysis and descriptive data analysis quantitative. Qualitative descriptive data analysis was conducted to analyze the result data observations made on preliminary studies conducted by the researchers before entering the field, and also the result of charging questionnaires and expert questionnaires against draft models that have been prepared by researchers then analyzed by experts prior to implementation. The process of data analysis begins by examining all available data from various sources, ie from interviews, observations already written in field notes, personal documents, official documents, pictures, photographs, Stage of data analysis conducted in this research as done that is: (1) data reduction, (2) data presentation, and (3) drawing conclusion [11].

From the calculation results of significance tests can be interpreted that, the test results data obtained from the subjects miss one or more. All indicate that the results of the count reject H_0 with a count value that is far above the value of t table. All showed significant improvement results due to improvements in the results of the basic technique skills of O'Brien style shot-put force increased by 16.0% - 25.0% in the experimental group and 2.0% - 19.0% in the control group. Based on the results of calculating the difference in scores after completion of the final test, showed a greater score difference for the group given the treatment model of the exercise developed by the researcher. . In the axiological perspective of sports science, in accordance with Law no. 3 years 2015 on the National Family System, sports activities can be divided into three types, namely: sports education, recreational sports and sports achievements [17]. An explanation for the sport of achievement has been much mentioned above. In sports education, sports biomechanics play a role for the development of science. Biomechanical analysis is based on scientific evidence. Research and development of the theory of sports biomechanics into the area of educational sports. The emphasis of biomechanical analysis on recreational sports is more directed at injury prevention. How safe movement in exercise can be the focus of his study. Hopefully, a healthy sport does not turn into a disaster because of a mistake in the motion. Soeharsono highlighted the different functions of sports biomechanics in education physical and sports. In some ways, between physical education and sport are present meaningful differences even though physical education is always equipped with sports. On physical education, the teacher's

knowledge of sports biomechanics is sufficient to (1) analyze the technique safe, effective and efficient motion, (2) distinguish between right and wrong motion techniques, (3) evaluate: identify errors then correct, and (4) find new ways better [16].

IV. CONCLUSION

This preliminary study was conducted one of them through research of opinion polls to the public, especially sports teachers throughout Indonesia through an online questionnaire disseminated through social networking. Expert evaluation results for quantitative data obtained in the form of the final percentage of expert evaluation is 78.24%, so it can be interpreted that the product design development of the basic technique learning style of O'Brien can be continued on the production of the model of the basic technique skills training technique obrien-based biomechanical studies, and proceed to the trial at a later stage Based on the results of the research can be concluded that athletic sports on the shot putt number of O'Brien style is a sport that has good prospects to be developed towards achievement. Product development model Basic technique training technique of O'brien style shot-based force based on biomechanical study based on test results of significance to the experiment can be concluded can improve Achievement and mastery of basic technique of starting O'Brien style at SMK Negeri 1 Kalijambe Sragen effectively and efficiently. This is based on the result of calculating the difference in the final score increase after the final test which showed a greater score difference for the group given the treatment model of the exercise developed by the researcher.

SUGGESTION

1. For Students: Students are expected to pay close attention to the contents as well as giving instructional materials on basic technique skills of the O'Brien style wielding force based on biomechanical studies.
2. For Teachers
For teachers, the use of interesting learning media can motivate students should always be developed in order to better motivate students to explore themselves tminat and about his own talent and can be developed toward achievement.
3. For Researchers
For researchers who will develop the learning model of O'Brien's style of reject should pay attention to

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