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The Effect of Using a Paralon Bow on the Archery Performance of Novice Athletes

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Abstrak

Pendahuluan: Kegiatan memanah, dimana kegiatan tersebut diorientasikan pada ketepatan anak panah mengenai sasaran, hal ini memerlukan ketelitian dan konsentrasi. Seorang pemanah harus mampu mengambil tindakan yang tepat pada setiap anak panah yang ditembakkan. Tujuan: Penelitian ini untuk mengetahui peningkatan hasil panahan jarak 10 meter melalui modifikasi anak panah dari pipa pvc bekas pada atlet pemula Perpani Tulungagung. Metode: Penelitian ini termasuk penelitian kuantitatif, dengan jenis penelitian yang dilakukan adalah penelitian tindakan kelas. Subyek dalam penelitian ini adalah atlet pemula Klub Panahan Beji yang berjumlah 15 orang. Teknik analisis data yang digunakan adalah teknik persen. Hasil: Hasil analisis data penelitian ini menyimpulkan bahwa: Data siklus I tes keterampilan penampilan panahan 10 meter menunjukkan bahwa atlet yang mencapai kriteria ketuntasan minimal hanya 33,3% yaitu 5 atlet yang tuntas, dan 10 atlet yang tidak tuntas (66,6%). Pada siklus II terjadi peningkatan ketuntasan sebesar 50% yaitu 14 atlet tuntas (93,33%) dan 1 atlet (6,66%) belum tuntas. Kesimpulan : Penelitian latihan memanah diatas menggunakan busur dan anak panah yang dimodifikasi dengan kompetensi dasar memanah jarak 10 meter, sebelum tindakan dan sesudah tindakan menunjukkan bahwa atlet mengalami peningkatan nilai latihan tes menembak.

Kata Kunci: *Modifikasi, Pipa Bekas, Panahan, Prestasi*

Abstract

Introduction: Archery activities, where the activity is oriented towards the accuracy of the arrows on the target, this requires accuracy and concentration. An archer must be able to take the right action on each arrow fired. Objective: This study is to determine the improvement of archery results at a distance of 10 meters through modifying arrows from used pvc pipes in novice athletes Perpani Tulungagung. Methods: This research includes quantitative research, with the type of research conducted is class action research. The subjects in this study were 15 novice athletes from the Beji Archery Club. The data analysis technique used is the percent technique. Results: the results of data analysis, this study concluded that: The first cycle data of the 10-meter archery performance skill test showed that athletes who reached the minimum completion criteria were only 33.3%, namely 5 athletes who were complete, and 10 athletes who were not complete (66.6%). In the second cycle there was an increase in mastery by 50%, namely 14 athletes completed (93.33%) and 1 athlete (6.66%) was not complete. Conclusion: the research above archery practice using a modified bow and arrow with the basic competencies of archery at a distance of 10 meters, before action and after action shows that athletes experience an increase in the value of shooting test practice.

Keywords: *Modification, Used Pipe, Archery, Achievement*

INTRODUCTION

Archery is a static sport that requires good physical condition, especially upper body muscle strength and endurance. Archery is a branch of target games or target games (Vanagosi, 2015). Archery as an individual game is included in the target game (Prasetyo, 2015). When performing archery techniques, especially when pulling the strings, the muscles experience isotonic contractions. At maximum traction, the fingers of the pulling arm should touch the chin, the fingers should be under the chin (anchor), and the arm holding the bow should be fully locked with the pulling arm. Thus the muscles involved in pulling the bow must receive special attention in the sport of archery, because these muscles work optimally in pulling and holding the weight of the bow which is quite heavy and takes place repeatedly in a series of archery movements. Thus the muscles involved when pulling the bowstring need to get extra attention because the muscles work very extra (Yulianto et al., 2015). Therefore, these muscles must have the strength and endurance to be able to pull the bowstring, so that it remains consistent and steady in accordance with the axis of motion. The muscles that need to be trained and developed in archery are neck muscles, shoulder muscles, tricep muscles, forearm muscles, wrist muscles, abdominal muscles and leg muscles. Apart from arm muscles, physical fitness factors also determine accuracy in archery (Susanto et al., 2021).

Archery activities, the right activity requires precision and concentration. Concentration is very important for an archer so that the results obtained are maximum (Teofa et al., 2021). An archer must be able to perform precise actions with every arrow fired or fired. From this point of view, the movement of archery is related to anatomical aspects, especially the structure of the arm, so that the bow pressure is supported by the arm holding the bow. To prevent the arm muscles from working too hard, the arm must be straight. Enhanced to reduce the incidence of injury. Bow stance makes archery more efficient when the bow arm forms a straight line. In other words, the energy expended for pressing is well adapted. Efficient movement means making movements with less force. Inefficient movement, on the other hand, leads to wasted energy and excess tension, accelerating physical and mental fatigue, pain, and frustration. So in archery sports activities, excellent physical condition is needed to support each exercise and at the time of the competition.

At present the public interest is very enthusiastic and has a desire to feel the sensation of archery, this can be seen by the many archery clubs that have sprung up, from the data on the archery website id there are around 217 registered archery clubs and there are still many extra curricular archery activities. in schools from elementary to university level. A common obstacle faced by novice athletes when starting archery is constrained by the high cost of tools or arrows, from the results of the author's search, the price of a standard bow or bow that is standard for competition in online stores ranges in price from 2 million to 5 million, of course. This is one of the obstacles for novice athletes who want to explore archery. This is also in accordance with the opinion of Yudik Prasetyo (2015) that the current price of archery bows is relatively expensive . Along with the development of knowledge, it turns out that bows can also be made from used paralon materials, this will make players not feel burdened in working on tools or bows. Archery competitions using paralon bows for beginner athletes have been widely contested, especially in the East Java area. Paralon round archery competitions usually use a distance of 5 meters at the elementary school level, and 7 meters at the junior high school level, with the furthest being 10 meters.

Media modification learning can be carried out optimally in club and school training, and the modifications that must be made are modifying the bow Humaid by changing the bow by changing the composition according to the conditions or needs of the athlete (Humaid, 2017). The modifications made to this bow are changing the composition of the material and its weight so that the diameter of the bow is adjusted to that of a standard bow. The advantage of using a paralon-based bow is that this tool does not require the same precautions as a standard bow made of aluminum with a heavier weight (Ratih &

Prabawanti, 2010). Improving the quality of learning that has a direct impact on improving the quality of education. Therefore, through paralon media it is hoped that there will be an increase in the quality of learning which in turn will be able to increase the achievement of learning achievements for athletes.

Based on observations at the beji archery club, it is held three times a week. The equipment owned by the club is quite complete, the bow that is owned is a bow with a standard bow model made of wood, bamboo, and a mixture of fibers in the limbs (curved bow parts). The arrows used use arrows made of bamboo. Even though they have complete equipment, the amount they have is not sufficient for all athletes. When the recovery took place, it was seen that the athletes queued longer to wait their turn to shoot than the practice of archery. The learning activities also show that athletes often scramble to overtake each other because they can't wait for their turn to shoot.

This makes the learning process less effective, less fun, boring and results in athletes having less learning experience. The results of interviews with archery trainers can be concluded that the learning process has been running smoothly but is less effective because the bows they have are very limited. In addition, some athletes admit that the bow used is too heavy and there are several parts of the bow such as the arrow rest which complicate the shooting process. The bow used in the club has a pulling weight ranging from 18-20 pounds (Besthari, 2019) this is also an obstacle because the athlete's strength has not been able to pull a bow with this pulling weight. Based on interviews with archery coaches, this is because athletes are holding a bow for the first time. The solution that can be done to solve this problem is to make modifications. Modification is an attempt to make changes to the physical form or method to make it easier to accept or do. In the context of physical education, modifications can be made by trainers if the facilities and infrastructure are inadequate and do not match the characteristics.

Modification is something that the club coach must be able to do and master. Regardless of whether the type of modification made is in the form of sports equipment, fields, or types of games, a trainer will definitely face limited infrastructure. This modification arises based on developmental demands to overcome several problems encountered in the field such as child boredom, lack of exploitation of children's movement abilities, and the characteristics of early childhood that are different from adult children (Yono & Sodikin, 2020). The word "modification" in the Big Indonesian Dictionary (KBBI) is defined as "change", "change". Where this means changing from the old form to a new form so that it has more quality and value. Defines modification as "a change from an old state to a new

state (Sahabuddin et al., 2022). These changes can be in the form, function, method of use and benefits without completely eliminating the original characteristics. Further understanding is explained by the Ministry of Education and Culture (1988) that modification is a change. The following is a modified image of an archery bow from a used paralon in Figure 1.



Figure 1. Paralon bow

Changes to game facilities and infrastructure are simplifications of materials, shapes, and sizes of facilities and infrastructure without any deviations in function in mastering basic techniques in playing. There are several reductions or changes from the original structure in making modifications. According to Happy Yoyo and Adang Suherman these changes include (1) the size of the field, (2) the shape, size and amount of equipment used, (3) the types of skills used, (4) the rules of the game, (5) the number of players , (6) player organization, and (7) game objectives (Hasanah, 2016). Modifications are made by looking at the conditions of the students and the situation when learning. Teachers should have good ability and creativity to make modifications so that the learning process can be fun and fit for purpose. Modifications in physical education learning can be done by dividing the material objectives into several components.

According to Happy Yoyo and Adang Suherman (2000), it can be categorized into three components: (1) extension objectives, (2) improvement objectives, and (3) implementation objectives. Physical education teachers must understand several principles that must be followed when making changes. There are several principles that need to be considered in implementing physical education modifications. According to Happy Yoyo and Adang Suherman (2000:16), these principles include: , (5) when children grow and develop, (6) strengthen previously learned skills, (7) teach them to be smart players, and (

8) develop their emotional and social development. Corrective tools in physical education are needed to satisfy students, increase the success rate of participation, and help students move properly.

The need for physical education facilities and infrastructure must be considered when adjusting the facilities during training. The modifications made must be able to meet the needs of athletes and improve the learning objectives to be achieved. According to Agus S. Suryobroto (2004), the needs for physical education facilities and infrastructure include (1) security, (2) simple and cheap, (3) attractive, (4) stimulating physical activity, and (5) needs. (6) depends its purpose; (7) scratch resistance; (8) depending on the environment. It can be concluded that changes in physical education are changes in game structure, facilities and infrastructure, and game objectives. There are many things that need to be considered in making changes, such as the purpose of the change, the principle of the change, the structural factors of the game being changed, and the need for sports facilities and infrastructure.

RESEARCH METHOD

This type of research is classroom action research. Classroom action research is an examination of learning activities in the form of an action, which is deliberately raised and occurs in a class together (Suharsimi Arikunto, 2013). The procedures or research steps carried out are divided into cycles, where each cycle consists of four main activities, namely activities: action planning, observation, and reflection. These four activities take place simultaneously, the order of which can be modified. The model used in this study is the Kemmis and Mc Taggart models. This model was chosen because the results of research using this model can be used as material for consideration in improving and perfecting archery in novice athletes. The data obtained in this study were analyzed using descriptive comparative, namely by comparing the quantitative data from Cycle I and Cycle II. Based on the results obtained from the pre-test and post-test which reflect the athlete's understanding of the concepts given in the training, it is hoped that there will be an increase in understanding according to the values obtained by each athlete. At least 75% of total athletes achieve complete training results. The source of the data in this study was in the form of quantitative data obtained from the research subjects in the form of data on the results of the athlete's archery performance assessment results.

RESULT AND DISCUSSION

First Cycle

The condition of the first cycle of archery at a distance of 10 meters for 15 Beji beginner athletes in the following table 1:

Table 1. First Cycle Archery Value Results

The highest score	90,45
Lowest Value	39,04
Average	54,58
Complete	5
Not Completed	10
complete (%)	33,3
Not Completed (%)	66,6

Referring to the table, only 5 athletes have the ability to shoot at a distance of 10 meters for the athlete's rating of the ability to shoot at a distance of 75 which exceeds the set minimum completeness criteria of 75 so that only 42.42% are achieved. The first cycle or initial condition of TP training. Archery sports show that these athletes like archery practice in general, based on survey observations. archery. Observations during the core activities taught archery techniques with the PVC pipe archery training method. Take turns shooting for all athletes from a distance of 7-10 meters. Paralon whistle bows aren't difficult, and it's easy to learn to pull the strings to their fullest, so they seem content. They did their job without anyone complaining and could shoot if so aimed. After the activity was over, they looked happy and didn't feel tired, and they said to each other that they were good at drawing bows. Due to the method of practicing PVC pipe archery, the basic moves of archery are often repeated. Researchers and collaborators evaluate the process of ongoing training. Given the reality of the formative process, this meeting must be continued to continue the second cycle. The recommendation was agreed that the number of methods of practicing archery from used PVC pipes should be increased.

Second Cycle

In the second cycle, observations made during the training process and observations made after the training process were completed were used to describe the results of the research. Upon entry, the athletes line up in groups of four for prayer, attendance, and understanding real-life archery. Archery for Health improves hand-eye coordination and balance, increases hand and finger flexibility, increases body strength, increases endurance,

increases concentration, increases self-confidence, and strengthens the body, for relaxation. Continuation of warm-up with archery with paralon tubes, athletes divided into three teams. Athletes take turns shooting against all athletes from a distance of 3m, 5m, 7m to 10m. In addition, you will be given the opportunity to use the Standard Bow with the aim of understanding the basic techniques of its mastery.

Observation during core activities, namely providing basic motion techniques starting with (1) standing position, namely by sideways or standing sideways facing the target, the location of the right and left feet opposite the shooting line, then the distance between the right and left feet according to shoulder width; (2) attach the arrow, namely holding the arrow using the thumb and forefinger, make sure the tip of the arrow is at the bottom with a slope of 450, and really fits the bowstring; (3) preparation, namely pulling the rope and relaxing the fingers when pulling; (4) preparation for withdrawal, namely lowering the arms and hands, elbows and shoulders parallel during the full pull, and pulling the rope; (5) full withdrawal, namely pulling the bowstring until the string touches the nose and chin as a marker, lowering both shoulders when fully drawn, pulling with the right hand, look with the right eye before releasing; (6) the anchor, that is, in this position all energy is collected and waiting for the moment to be released, the left arm is in a safe position to make room for the rope when it is released, and the right eye is still aiming at the target; (7) aim at the target, namely aim at the target using the right eye, and hold your breath before releasing the rope; (8) releasing, namely releasing the string in a relaxed manner without moving any muscles other than the fingers of the right hand which releases the bowstring, relax both wrists together as soon as the arrow is released and the right hand backs up behind the ear; and (9) follow-up, namely remaining silent for a while after the arrow leaves the bow, and controlling the motion of the arrow being carried out.

Archery activities start at a distance of 3 meters, 5 meters, 7 meters and 10 meters so that athletes are stimulated to master the basic archery techniques to the fullest. They looked very happy doing this activity, all the athletes did jumps alternately and continuously. At the end of the lesson, a performance evaluation is held with the results in table 2 below:

Table 2. Second Cycle Archery Value Results

The highest score	91,53
Lowest Value	71,37
Average	81,31
Complete	14
Not Completed	1

complete (%)	93,33
Not Completed (%)	6,66

Referring to the table, it can be said that the value of the basic movement ability of archery at a distance of 10 meters through the bow training method from paralon pipes above the Minimum Completeness Criteria of 75 is 14 athletes (93.33%) and athletes who score below the Minimum Completeness Criteria are 1 athletes (6.66%). After the activity was over, they looked happy and didn't feel tired and they often repeated the basic archery movements. After completing the training they were given a questionnaire on the athlete's responses to the training they had just carried out. Following are the results of the second cycle questionnaire in table 3.

Table 3. Results of the Second Cycle Athlete Response Questionnaire

No.	Question	Yes		No	
		Total	%	Total	%
1.	Is the material provided about basic archery techniques fun?	15	100	0	0,00
2.	Is it fun to practice the gradual basic techniques?	15	100	0	0,00
3.	Is the bow training method from used paralon tools fun?	14	94,44	1	11,11
4.	Does a bow from a used paralon tool provide comfort when shooting?	14	94,44	1	11,11
5.	Does a bow from a used paralon tool provide security when shooting?	14	94,44	1	11,11
6.	Can a bow from a used paralon reach a target of 3 meters?	15	100	0	0,00
7.	Can a bow from a used paralon reach a target of 5 meters?	15	100	0	0,00
8.	Can a bow from a used paralon reach a target of 7 meters?	13	88,89	2	11,11
9.	Can a bow from a used paralon make you focus and concentrate on the target?	13	88,89	2	11,11
10.	Does the bow tool from used paralon stimulate the target results at a distance of 10 meters?	14	94,44	1	5,56

The researcher conducted a process evaluation of the training that had taken place. The researchers used the performance assessment for archery at a distance of 10 meters to determine the continuation of the cycle because the data from the collaborators was only a comparison, if the difference in results was not significant then the data was considered the same. The results of the performance assessment, that the value of the ability to shoot at a distance of 10 meters above the Minimum Completion Criteria of 75 was 15 athletes (93.33%) and athletes who scored below the Minimum Completion Criteria were 1 athlete (6.66%). The researcher reflected on the training that had taken place. Paying attention to the results of observations during the training process, including the value of the archery performance test at a distance of 10 meters which has exceeded the target of 80% and an increase in the results of the athlete's response questionnaire. Archery using the archery training method using a paralon bow has been successful.

Discussion

The training approach through the use of the archery method using used paralon pipes needs to be developed in planning training by taking into account the training material, the characteristics of the athletes. So that the lack of facilities and infrastructure available at the club can be overcome, and is no longer an excuse for a trainer not to provide maximum training to athletes. Archery contained in the training curriculum is designed and implemented while still referring to the needs of athletes both physically and mentally.

Preliminary data on the archery performance skill test at a distance of 10 meters shows that only 44.44% of the athletes who achieved the Minimum Mastery Criteria, namely 5 athletes (33.3%) completed, 10 athletes (66.6%) did not complete. In cycle one there was an increase in mastery by 50%, that is, 14 athletes (93.33%) completed, 1 person (6.66%) did not complete. From the results of this study it can be concluded that the action with the archery training method using paralon pipes which was carried out in 1 cycle with 2 meetings was proven to be able to improve performance tests and the athlete's responses were very good or pleasant. Athletes who still score below the Minimum Completeness Criteria are due to the athlete's lack of mastery of the techniques given in executing archery. They only like to shoot without following the meaning of using the archery training method with the modification of the auxiliary tool in the form of a paralon pipe, namely 1 athlete or 6.66% has not completed the first cycle. So that archery training is not boring, it is necessary to carry out various supporting exercises such as modifications to playing exercises (Susanto et al., 2022).

According to Priambodo the use of a bow can increase the results of shots (Priambodo & Pustikaningsih, 2018). The paralon modification is made into a bow as a tool development that is quite adequate and helps novice athletes in training. In addition, according to Marzuki et al (2019) bows can improve athletes' skills in archery (Marzuki, Bagus Kurnia, 2019). The results of shooting in archery extracurricular activities for students increased by 35% (Pradana, 2018). This has proven that the use of arrows made of anvil pipes is quite effective. In addition, the purpose of using this paralon bow is as an effort to improve Indonesia's archery performance (Septian, 2012).

The mechanism of muscle work in the arm muscles is very noteworthy because these muscles work extra hard in pulling the bowstring (Yulianto et al., 2015). With extra attention to the arm muscles, the muscles will easily adapt and it is expected that muscle endurance and strength will be good so that performance will be better. With good performance, of course, the results of shooting arrows will be better too. Besides that, concentration is needed by an athlete, so that the shots made are optimal (Teofa et al., 2021). By using a modified bow archers are able to shoot their arrows at the target better (Sahabuddin et al., 2022). In addition, imagery practice is important when shooting arrows (Akbar et al., 2019).

CONCLUSION

Based on the results of the research and discussion, it can be concluded that the action with the archery training method using a modified bow from used pvc which was carried out in 2 cycles with a total of 3 meetings, was able to improve archery practice. This can be seen from the results of observations made by researchers compared to collaborators during the training process. Based on the data from the research results above, in archery training with basic competencies of archery at a distance of 10 meters before action and after action, it turns out that athletes experience an increase in the value of archery performance test exercises.

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