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ANALYSIS OF LAY UP SHOOT MOVEMENTS IN STKIP PGRI BANGKALAN SPORTS EDUCATION STUDENTS

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Abstract

Kinovea software to collect and analyze video data showing the implementation of basketball lay-up techniques by sports education students in 2022. The aim is to evaluate the level of accuracy of the movements demonstrated by the students. Before data analysis was carried out, videos were taken directly during the implementation by students. This research adopts a descriptive approach with qualitative methods. The process of taking a video using an iPhone camera. The Kinovea application is used as a tool to analyze physical conditions and body movements during lay-ups. The sample was selected using a purposive sampling method because of limited time and energy in studying a large population. It is hoped that the results of this research will provide a better understanding of the implementation of lay-up techniques and provide guidance for the development of more effective training programs in the future.

Keywords: Biomechanics, Basketball, Kinovea, Lay-up

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INTRODUCTION

Physical education is a medium for encouraging the development of motor skills, physical abilities, knowledge and reasoning, appreciation of values (attitudes, mental, emotional, spiritual, social), as well as the habit of healthy lifestyles which lead to stimulating balanced growth and development and can provide encouragement to encourage children to be braver in carrying out activities such as playing sports (Handayani, Y. et al., 2022). Physical education and sports can also provide more knowledge so that children can further develop what is within them (Sahutu, et al. 2021).

In general, people understand that sport is a physical activity carried out by people or groups of people with the aim of achieving physical fitness (Hidayatullah, 2017). Sport is a means that encourages the improvement of human character and personality, with a focus on forming discipline, sportsmanship, and achieving proud achievements. In a broad spectrum. Sports include various branches such as

athletics, water sports, games and martial arts (Anggia, 2019). In sports, we also need sports management so that the goals to be achieved must be through careful planning. Sports training plans are made based on existing initial conditions (Agus, A. 2012).

Sports can be given great attention to improving the quality of health, physical fitness and achievement standing for humans (Iqroni et al., 2022). Sports activities have the main goal of making the body healthy. However, the sports that people do have different goals. One of them is sport for education, sport for recreation and sport for achievement (Pratama. N.T et al., 2022). Among the various sports choices, game sports, especially basketball, football and volleyball, are favorites among students and students (Hapsari et al., 2013).

Game activities consist of various movement skills and playing skills that students must master in order to achieve success in a game (Benny, A. et al., 2023). There are several training factors in the game that need to be prepared in every sports training program, including : (1) physical preparation, (2) technical preparation, (3) tactical preparation, and (4) psychological preparation, namely mental (Kusumawati, M & Muhamad, M , 2020). One form of preparation for technical training factors is to provide an overview of basic technical characteristics, so that movement errors will (Kusumawati & Muhamad, 2020)be minimized .

Basketball is a team sport that requires collaboration between team members to score points and prevent the opposing team from scoring points (Ridwan, 2021). Apart from the main goal of scoring more points than your opponent, the content of a basketball game can be determined by a variety of strategies that will be implemented, but the balance between technique and strategy is a factor in achieving success in the game of basketball. (Hidayatullah, F. 2020). This makes the sport very popular among youth, with the majority of players being teenage boys. However, this sport does not respect age or body size, and can even be played by individuals with physical limitations. Originally played indoors, now basketball is also played outdoors (Kurniawan et al., 2022).

In the sport of basketball in particular, there are many things that need to be further refined considering that basketball is a sport that has quite complex characteristics, from individual abilities to the characteristics of each team's game, which will always be different from one another (Hidayatullah, F. 2012). Mastery of physical, technical and tactical aspects is the main asset for players or athletes in the game of basketball. Basic techniques in the game of basketball, such as shooting , passing , and dribbling , are the foundation for success in the game (waffa, A. et al., 2020).

Among the existing techniques, *shooting* is key, because it is an attempt to score points (Ahmad, N. 2016). In the game of basketball there are two shots, namely inside shots and outside shots. In the game of basketball, the deep shot that is often taken is a shot from the *medium range area* or it can also be called the perimeter area (Hidayatullah, F. 2009). Practicing *shooting* skills requires repeated practice, apart from that it requires correct basic techniques and variations in training models. In the context of this basic technique, there is *shooting lay up* , is now the key to scoring points. The shape of the hand to put the ball into *the ring* is divided into two *lay techniques up* , namely overhead and underhead (Siahaan et al., 2020). These two techniques are carried out according to the player's condition and also the needs during the match, but *the lay-up* is *overhead lay-up shoots* better than *underhand lay-up shoot* . Both of these techniques are especially important in situations close to *the basket* , allowing players to score points efficiently (Permadi, 2016).

To understand the movements in basketball *lay-up techniques*, biomechanical analysis is one tool that can be used. Through this research, the aim is to identify the use of biomechanical analysis in evaluating *lay-up techniques* in Sports Education students at STKIP PGRI Bangkalan. Thus, it is hoped that this research can provide a deeper understanding of the importance of biomechanical analysis in improving the quality of technique in basketball.

METHOD

The research method used in this research is descriptive qualitative. Qualitative descriptive research aims to describe the status of human groups, objects, conditions, systems of thought, or current events systematically, factually, and accurately (Melliani & Utami, 2021). This research aims to determine *lay-up skills shoot* at Sports Education students at STKIP PGRI Bangkalan. The research location was carried out at the SOKA PARK field during the T and P basketball course for STKIP PGRI Bangkalan students, while the research took place on Monday morning when the course was held.

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RESULTS AND DISCUSSION

Researchers used the *Pearson Product Correlation technique Moments* to test validity and *Paired Sample T- Test* for reliability testing. This test is only carried out for online test instruments . This research uses:

Figure 3.1 Table of right and left *lay-up* data results from the kinovea application

No	Name	Force		Knees Feet		Hand Elbow	
		Right Lay-Up	Left Lay-Up	Right Lay-Up	Left Lay-Up	Right Lay-Up	Left Lay-Up
1	Ach. Zubadar	138.2°	118.0°	95.8°	83.1°	149.1°	141.3°



No	Name	Force		Knees Feet		Hand Elbow	
		Right Lay-Up	Left Lay-Up	Right Lay-Up	Left Lay-Up	Right Lay-Up	Left Lay-Up
2	Subairi Al Farohan	124.5°	132.1°	168.1°	57.7°	144.5°	171.4°
3	Lailatul Fitria	151.4°	160.2°	138.1°	102.4°	153.3°	147.3°
4	Dinda Septiana	144.6°	133.0°	100.2°	56.8°	154.7°	148.4°
5	Maski	138.9°	143.5°	36.1°	32.7°	149.7°	177.9°
6	Imam Suhaimi	139.6°	145.9°	125°	119.1°	140.5°	158.7°
7	Ah. Dwi Romadhoni	140.2°	133.6°	123°	127.2°	160.4°	171.5°
8	Ach Maulana Abim	157.1°	144.3°	161.4°	66.2°	174.8°	158°
9	Ach Nurul Yaqin	135.9°	120.3°	97.0°	87.3°	142.4°	160.9°
10	Aftoni Milky Bustomi	145.2°	138.8	105.1°	73.8	169.9°	171.1
11	Ahmad Dzairobi	123.5°	145.7°	151.4°	142.2°	159°	163.3°
12	Ahmad Maulidi	-	-	-	-	-	-
13	Ainul Topek	132.1°	132.1°	57.7°	57.7°	171.4°	171.4°
14	Aldia Faradila Anwar	133.5°	135.0°	95.9°	95.9°	129.2°	129.2°
15	Alfi Raudatul Fadila	140.2°	140.2°	89.4°	89.4°	134.6°	118.0°
16	Asroful Anam	148.2°	132.1°	115.4°	57.7°	171.4°	171.4°
17	Khoirul Arifin	153.5°	148.3°	128.2°	178.2°	133.1°	151.9°
18	Desty Suci Dwi Putri	137.0°	134.1°	116.3°	140.2°	123.4°	129.1°
19	Hadori	153.4°	138.5°	140.2°	160.6°	157.6°	162.1°
20	Haris Darun Nafis	141.5°	175.6°	52.3°	75.4°	111.4°	125.7°
Average		141.6	139.5	110.3	94.93	149	155.5

This research focuses on obtaining information about the optimal angle when performing a *lay-up technique* in basketball, which is very important for understanding efficient movements in scoring. From the data obtained, *the force angle range* is 139.5° – 141.6° for lay up right and lay up left, these results are said

to be less good when compared with research conducted by (Susanto, 2019). states the range of knee angles before laying up by $90 - 120^\circ$. Based on this analysis, the force angle needs to be increased in the future .

The average results of other variables assessed were the knee angle when doing a lay up and the elbow angle when doing a lay up. The research carried out (Pebriany, et al., 2021)obtained hand angle results of $131.0^\circ - 132.9^\circ$ in both right lay up and left lay up and foot angle results of $134.9^\circ - 151.9^\circ$ in both right lay up and left lay up. The results obtained show that the average elbow angle is $149 - 155^\circ$ and the knee angle when doing a lay up is $94.93 - 110.3^\circ$. When compared with research, the (Susanto, 2019)averages obtained show that the numbers are quite different with a margin of around $18^\circ - 122^\circ$. Based on these results, it shows that the average subject has not performed the lay up technique well so it needs to be improved at the next opportunity.

individual data , there are several participant data that have values close to the optimal value according to data from (Pebriany, et al., 2021)and during (Susanto, 2019)*lay-up* movements . The right *lay-up* angle is approximately 153.5° and lay up left around 151.9° shows Khoiril Arifin's ability to maintain consistent body movements. Visible symmetry in lay angles up right and left also shows that he is able to regulate his body movements well in making *lay-up movements* . Consistent control of hand angle when releasing the ball, with a right hand angle of approximately 128.2° and a left of approximately 151.9° , is also an indication of good technical skill.



Figure 3.1 Image of participants performing a right *lay-up* using the kinovea editor application

Based on Figure 3.1, participant movements can be analyzed in even the smallest frames . The movement of participant Khairul Arifin shows the initial stage in the *lay-up technique*, namely the eyes facing the *lay-up lane* .



Figure 3.2 Image of participants performing a right *lay-up* using the kinovea editor application

After seeing the layup line . The next *lay-up* technique is to look at the target, namely *the ring* , as shown in Figure 3.2. Next, the *lay-up* technique is carried out by the *lay-up step* . In step 3, the angle in the last step is done in Figure 3.2 with an angle of 153.6° .



Figure 3.3 Image of participant doing a right *lay-up*

Figure 3.3 shows the leg angle and elbow angle when *releasing* the ball goes to the *ring*. This stage is the final stage of the *lay-up* and the ball is thrown into the *ring*. Based on this image, the angle obtained is 128.2° and the elbow angle is 133.1°.

With the ability to slow down movements, highlight specific stages, and accurately measure angles, Kinovea provides an extremely useful tool in identifying and analyzing technical aspects of sports movements. The use of kinovea has helped researchers to examine elevation angles that indicate effective right or left *lay-up techniques*.

CONCLUSION

Based on the results of analysis using kinovea, it was found that the right and left lay-up angles of the research subjects were in the range 139.50° – 141.6°, which was considered less than optimal compared to the range of 90° – 120° suggested by (Susanto, 2019). In addition, the elbow angle during lay-up ranged between 149° – 155° and the knee angle between 94.93° – 110.30°, which was significantly different from the research results (Pebriany, 2021), indicating that the subject had not fully mastered the lay-up technique well. Some participants, however, showed good consistency and technical skills, with a right lay-up angle of around 153.5° and a left lay-up of around 151.9°. The Kinovea application has proven to be very useful in identifying and analyzing lay-up technical stages,

providing in-depth insight for improving technique and movement efficiency in scoring.

For future research, it is recommended that more subjects be involved to obtain more representative data. In addition, special training programs that focus on improving angles that are not yet optimal need to be developed and implemented, so that players can improve the performance of their lay-up techniques. It is hoped that more intensive and continuous training can help players achieve the recommended optimal angles, so that lay-up technique and efficiency in scoring can be further improved.

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