Prima Magistra: Jurnal Ilmiah Kependidikan
Volume 6 – Number 3, July 2025, pp 317-327
https://doi.org/10.37478/jpm.v6i3.5577
Open Access: https://e-journal.uniflor.ac.id/index.php/JPM/article/view/5577

ISSN 2721-8112 (print)
ISSN 2722-4899 (online)

THE USE OF ANIMATED MEDIA ON SHOOTING LEARNING OUTCOMES IN BASKETBALL GAMES IN CHILDREN AGED 10-11 YEARS

Yopi Meirijal[1]*, Sumbara Hambali[2], Soni Hasmarita[3], Yovhandra Ockta[4]
[1,2,3]STKIP Pasundan, Cimahi, Indonesia
[4]Universitas Teuku Umar, Aceh, Indonesia
*Corresponding Author: yopimei12ok@gmail.com

Article History
Received : 20/04/2025
Revised : 19/05/2025
Accepted : 20/06/2025
Keywords:
Animated media, Shooting practice, Basketball, 10-11 years old children.

Abstract. This study investigates the effectiveness of animated media in improving basketball shooting performance among children aged 10–11 years through an experimental method, revealing that animation-based instruction significantly enhances training outcomes compared to conventional methods. The research was conducted at Cimahi Mandiri 2 Elementary School with a total of 40 students participating in extracurricular basketball activities. Using a total sampling technique, participants were randomly divided into two equal groups: one received animated media during training, and the other followed traditional instruction without animation. A basketball shooting test was used to assess performance improvements. The results demonstrated that the group exposed to animated media showed a significant increase in shooting performance (t=23.59>t-table=2.262), while the non-animation group also improved but to a lesser extent (t=12.68>t-table=2.262). Furthermore, a comparative test between the two groups yielded a significant difference (t=25.98>t-table=2.101), indicating a stronger impact of animated media. In conclusion, animated media significantly improves basketball shooting skills in children, and the results and conclusions are consistent with the study's objectives.

How to Cite: Meirijal, Y., Hambali, S., Hasmarita, S., & Ockta, Y. (2025). THE USE OF ANIMATED MEDIA ON SHOOTING LEARNING OUTCOMES IN BASKETBALL GAMES IN CHILDREN AGED 10-11 YEARS. *Prima Magistra: Jurnal Ilmiah Kependidikan*, 6(3), 317-327. https://doi.org/10.37478/jpm.v6i3.5577

Correspondence address:
Jl. Permana No.32B, Citeureup, Kec. Cimahi Utara, Kota Cimahi, Jawa Barat 40512. yopimei12ok@gmail.com

Publisher:
Program Studi PGSD Universitas Flores. Jln. Samratulangi, Kelurahan Paupire, Ende, Flores.
primagistrauniflor@gmail.com

INTRODUCTION

One of the achievements of the sport of basketball, at least there are some important things that must be possessed by players/athletes, both from internal matters and from their external matters. At least some important factors that must be possessed by athletes are such as physical abilities, technical abilities, the capability to implement strategies and cognitive skills processing (Newland et al., 2013). Basically, every player in doing a match requires the name of physical abilities, techniques, tactics and psychological abilities to support the achievement of success in his sport. It is said that physical abilities have a relationship with technical abilities and tactics during the match (Bogdanis et al., 2007). Without having a good basic technique, it is impossible for a player to play well during the match, and vice versa someone who has a good level of mastery of basic techniques will be able to play well during the match (Wasserman et al., 2018).

The actual ability to play from the basketball player from good technical skills, which had been obtained during the learning process from the beginning (Li et al., 2018). Basketball is a team game, where when you improve the basic technical skills it will help the team, because this game requires that every individual has a good basic skill that can later be connected to all games (Wissel, 2012). The technique is used to create game content and facilitate all tactical movements needed during the match, so that the team can work well together. Basic techniques that need to be mastered by enthusiasts, especially for beginners who want to learn to become professional players such as rebounds, catching and passing, pivot, dribbling and also shooting (Saichudin & Munawar, 2019). Therefore, the need to be able to interact properly between a team in a structured or unstructured manner needs to be done both when defending and when attacking (Marmarinos et al., 2016).

Shooting techniques or techniques of inserting the ball into a basket in a basketball game are one of the most important techniques, because this technique is the spearhead to get

numbers or points in a game. This technique is a basic technique whose treatment can determine in winning in the basketball match. Shooting is an important part of every learning session, although by not leaving other basic techniques (Zambová & Tománek, 2012). Shooting techniques in the basketball game are complex skills, which can be influenced by several things, such as basic mechanics including eye sight, body balance, hand position, elbow arrangement, foot and shot rhythm (Wissel, 2018). Each team in the Basketball will have a high percentage of victory if you have a player who has a good shooting accuracy during all phases of the game, despite varying physiological or psychological stressors (Pojskić et al., 2014). If there are some important things to become a shooter, including having a good body balance, high concentration, good body coordination, sensitivity, and have a shooting technique that forms such as satellite dish (Raiola & D'isanto, 2016). This is because the jump shoot technique is the most often used shooting technique (around 70%) in a match, and can be used during any situation, such as going to three points shoot or two points shoot (Struzik et al., 2014). To support the development of movement skills in children through physical education, it is essential to have teaching materials that encourage students to engage actively in various play and game activities (McKenzie, 2007). One of the teachers' roles is to evaluate the learning process carried out (Baldwin, 2015). Evaluation can take place whenever an assessment process is conducted, with the aim of determining the level of effectiveness and success achieved in the learning process (Tolgfors & Öhman, 2015). In the context of sports learning, the use of innovative and attractive learning media is very necessary to increase the effectiveness of learning, especially in children. One of the resources that can be utilized to enhance learning outcomes is animated media.

Animation media offers a visual approach that can clarify concepts that are difficult to understand through verbal explanations, and provide clear illustrations of the correct techniques in shooting in basketball. The use of animation can also make children more interested and involved in learning, because it is more interactive and fun than traditional methods (El & Lanos, 2024). However, although animated media are widely used in various fields of education (Singh & Ozarkar, 2024), research that discusses the effect of the use of animation media in sports, especially in learning to shoot basketball in children aged 10-11 years, is still relatively limited. Therefore, this research is important to find out whether the use of animated media can improve the learning outcomes of shooting in basketball games on children, as well as how they have an impact on motivation, understanding of techniques, and children's involvement in learning. In order to enhance the quality of education, teachers are expected to be capable of designing and developing learning activities that are more varied and innovative and are able to motivate students to be able to learn optimally both in independent learning and classical learning (Haryanto, 2021). Animated video media is a type of educational tool that presents engaging and visually appealing content images and writing so that it is easy to understand and imitate so that it can help the learning process effectively (Huljannah & Idrus, 2020). Animated video media is a form of audio-visual tool, as it combines both sound and visuals. There is a need to further develop this type of media in the pandemic period during online or hybrid learning because with hybrid learning students tend to feel bored quickly if the media given is still simple and monotonous because distance learning requires an interesting thing to remain motivated (Sukarini & Manuaba, 2021). The advancement of animated video media through technology can enhance the quality of student learning outcomes and assist teachers in the delivery of material through the development of media used as a means to deliver material (Wulandari, 2014). So that the display of animated video about the material to be learned can provide motivation to follow physical education learning is increasing, as well as an atmosphere of learning process that is not boring.

Animated video media is a media that contains a collection of sequential images and then the image is moved to become an animated video (Wulansari, 2014). Animated video is a computer program used in delivering learning that contains digital content with a combination between audio, text, images, and overall integrated animation (Antika et al., 2019). Through a combination of components such as text, images, audio, video and animation that are integrated,

the video is very appropriate to clarify abstract concepts to be more concrete (Diyana et al., 2020). In the animated video, learning material is delivered through dynamic visualization so that this can avoid excessive verbalization in the learning process (Tresnakova et al., 2023). The use of animation media in education helps capture students' attention, facilitating quicker comprehension and deeper understanding (Sari, 2017). The advantages of animated videos in the field of education are able to convey a complex concept that is visually and dynamic, attracting the attention of students easily, increasing motivation and stimulating more memorable students' thoughts, animation can also help provide virtual learning (Singh & Ozarkar, 2024).

Several previous studies have demonstrated that animated videos positively influence students' learning processes and outcomes. Stadlinger et al. (2021) found that animated videos enhance students' conceptual understanding and engagement during learning. Similarly, Bulkani et al. (2022) stated that animated videos help simplify complex materials, thereby improving learning outcomes. Hadi et al. (2022) also reported that interactive animation media contributes to increased student motivation. Safitri et al. (2021) emphasized that educational animations encourage active student participation in the learning process. In addition, Harefa & Gulo (2024) highlighted that interactive multimedia-based animations assist students in better understanding abstract subjects such as science and mathematics. Ramadhan et al. (2024) revealed that animated video media is effective for project-based learning approaches. Furthermore, Knapp et al. (2022) pointed out the importance of visual and narrative quality in educational animations to maximize learning effectiveness.

The primary goal of education is to assist students in unlocking and developing their full potential, enabling them to become a balanced human being between personal life and social life (Suharta et al., 2022). In life, learning is essential for everyone, as it allows individuals to comprehend and master new concepts, thereby enhancing their skills and abilities (Pasaribu, 2023). The learning environment is thoughtfully designed to foster the growth and development of all areas—physical, psychomotor, cognitive, and affective—for each student (Abizar et al., 2021). Although there are many studies on the use of animated media in various fields of education and sports, most research is more focused on the use of animated media in the context of academic education or sports for more mature age. Research that focuses on the use of animated media in learning techniques, especially shooting basketball in children aged 10-11 years, is still very limited. What's more, children of this age are in an important phase of motor and cognitive development, so the right teaching methods are needed. Most existing studies are more focused on the use of animated media in the context of learning theory or academic education. This study brings innovation by combining animation media as a tool in learning physical skills in sports. Using animation to visualize the right basketball shooting technique can provide a clear picture and easily understood by children, so that it helps them faster mastering the technique compared to relying on verbal instructions or direct demonstrations. This study focuses on children aged 10-11 years, which is an age group where fine motor skills, such as shooting basketball, are developing rapidly. Assessing the influence of animated media in teaching shooting techniques to this age group provides a new perspective that is more specific.

The purpose of this study is to analyze the effect of animated media on improving shooting skills in children aged 10–11 years in the context of basketball. Specifically, the study aims to examine the extent to which animated media can influence both the technique and accuracy of basketball shooting. The research design involves two groups: an experimental group that receives instruction using animated media, and a non-experimental (control) group that does not use animated media. The findings of this study are expected to offer valuable benefits, particularly in the field of sports education. First, it may provide evidence-based insights into the effectiveness of animated instructional tools in developing motor skills among young athletes. Second, the research can serve as a reference for coaches and physical education teachers in designing more engaging and effective training programs. Finally, this study contributes to the broader understanding of how multimedia-based learning can be applied

beyond traditional classroom settings, particularly in enhancing technical sports performance among children.

RESEARCH METHODS

This study uses the experimental method to identify a causal relationship between variables by deliberately manipulating one variable while controlling others. The research population consisted of 40 students participating in the basketball extracurricular at Cimahi Mandiri 2, Cimahi City, with total sampling used to include all students as samples. The sample was randomly divided into two groups: 20 students in the experimental group receiving animated media treatment and 20 in the control group without treatment. The instrument used was a basketball shooting test, which was validated through expert consultation and pilot testing to ensure reliability. Data were collected by administering the shooting test to both groups, and the results were analyzed using percentage techniques to compare shooting abilities. The independent variable was the use of animated media, and the dependent variable was the shooting ability in basketball.

RESULTS AND DISCUSSION

Research results the purpose of this study is to analyze the effect of animation media on increasing shooting skills (shooting) in children aged 10-11 years in basketball games. This study aims to determine the extent to which animation media can affect the technique and accuracy of shooting in basketball. For more clarity, you can see Table 1.

Table 1. The results of the average calculation and standard deviation for the shooting test

Group	Test Period	Mean	Standar Deviation
Group of animated media application (experimental group)	Pretest	17	1,56
	Posttest	27,1	1,85
Group without media application animation (control group)	Pretest	16,6	1,51
	Posttest	21,8	1,48

Based on the Table 1 above it is stated in groups with the application of animated media (experimental groups) the average initial test results of 17 and the average final test of 27.1. While the standard deviation of the initial test was 1.56 and the Final Test standard deviation was 1.85. In groups without the application of animated media (control groups) the average initial test results are 16.6 and the average final test is 21.8. Whereas the standard deviation of the initial test results was 1.51 and the final test deviation was 1.48 (Figure 1).

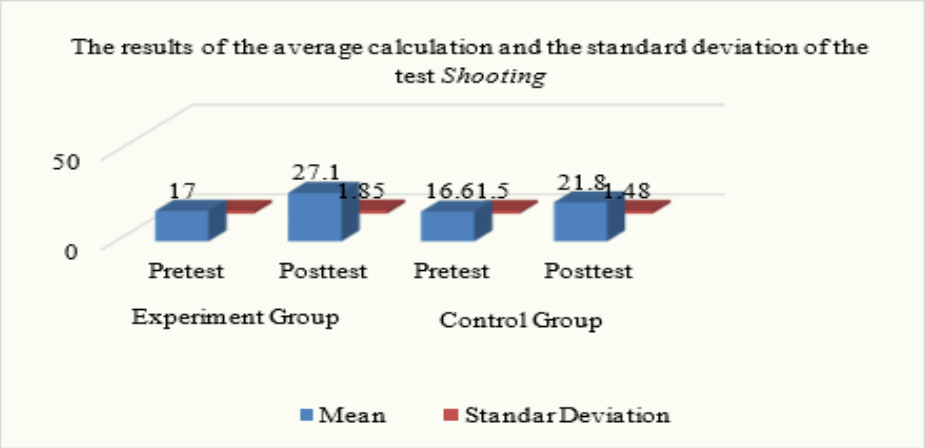

Figure 1. The mean scores of the experimental group and the control group

Then the researcher conducts a normality testing a. From the data the L value can be taken of 0.258. Because l count is smaller than l table (lo = 0.139 <lα = 0.258), the hypothesis is accepted or the distribution is "normal" b. From the data the value of L was taken of 0.258. Because l count is smaller than l table (lo = 0.123 <lα = 0.258), the hypothesis is accepted or in other words the distribution is "normal" c. From the data the L value can be taken of 0.258.

Because l count is smaller than l table (lo = 0.176 <lα = 0.258), the hypothesis is accepted the distribution is "normal" d. From the data can be taken the value of L is 0.258. Because l count is smaller than l table (lo = 0.206 <lα = 0.258), the hypothesis is accepted the distribution is "normal". Then calculate the significance test of increasing the results of the experimental group and the control group, For more details, you can see Table 2.

Table 2. Calculation of the Significance Test

Group	Test Period	Mean	Standar Deviation	t count (B)	t table 0,05	Result
Experimental group	Pretest Posttest	17 27,1	1.37	23.59	2.262	Significant
Control group	Pretest Posttest	16,6 21,8	1.32	12.68	2.262	Significant

Reject the null hypothesis (Ho) if t count is greater than t table (t count> t table) with (1-α); DK-1 or receive HO, if t count is smaller than t table (t count <t table (1-α); dk-1). From the results of the calculation and analysis of data based on the table above: a. From the list of distribution T with a chance of 0.05 and DK (N-1) = 9 can be obtained from T table = 2,262 because the value of t = 23.59 is beyond the limit of receipt of the hypothesis, the null hypothesis is rejected, which means the experimental group shows a significant increase (significant). b. From the distribution list t with a chance of 0.05 and dk (n-1) = 9 can be obtained from t table = 2,262 because the value t = 12.68 is beyond the limit. Then the Correlation Coefficient of the experimental group after the count of 0.690 is then substituted to the Sperman Brown formula obtained a value of 0.817 (high correlation coefficient). The control group correlation coefficient data after the count of 0.610 is then substituted to the Sperman Brown formula, a value of 0.758 (high correlation coefficient) is obtained. Thus the correlation coefficient of the experimental group 0.817 is greater than the correlation coefficient of the control group 0.758. Then the reliability of the test is included in the high category. An important factor is student learning motivation.

High motivation can encourage students to be more serious in following learning and practicing shooting techniques. Students who are motivated tend to be more focused, enthusiastic, and consistent in training, so that it will provide better results. In addition, the learning environment also has an important role. Adequate facilities, good field conditions, and the availability of appropriate equipment can support a more effective learning process. Another influential factor is the teacher's skills and experience in teaching shooting techniques and the use of animated media. Teachers who are experienced and skilled in using various learning methods tend to be more successful in delivering material and motivating students. The diversity of learning methods, such as direct demonstrations, practical exercises, and games, can also help students to better understand and master shooting techniques. In addition, the quality of animated media used, including visual and audio clarity, as well as relevance to the material being taught, also affects the learning outcomes. The duration and frequency of learning sessions that are quite consistent is also an important factor in helping students master shooting techniques better.

An important factor is student learning motivation. High motivation can encourage students to be more serious in following learning and practicing shooting techniques. Students who are motivated tend to be more focused, enthusiastic, and consistent in training, so that it will provide better results. In addition, the learning environment also has an important role. Adequate facilities, good field conditions, and the availability of appropriate equipment can support a more effective learning process. Another influential factor is the teacher's skills and experience in teaching shooting techniques and the use of animated media. Teachers who are experienced and skilled in using various learning methods tend to be more successful in delivering material and motivating students. The diversity of learning methods, such as direct demonstrations, practical exercises, and games, can also help students to better understand and master shooting techniques. In addition, the quality of animated media used, including visual and audio clarity, as well as relevance to the material being taught, also affects the learning

outcomes. The duration of this study analyzes the learning outcomes of basketball shoting learning in children aged 10-11 years, comparing an ecpreminent group and a control group or non-experiment. In accordance with the purpose of the study, namely to determine the effect of the use of animation media on shooting outcomes (shooting) in basketball games in children aged 10-11 years, where in this study there are two groups, namely the experimental group as a group given by treatment or treatment with animation media and control groups as a comparison group without treatment or treatment of animation media, which is done through pre-test and post tests in both groups to better know the level of signification.

Shooting is the basic basketball skill that is most popular, because everyone has instincts to attack and want to put the ball into the ring (Kosasih, 2008). Learning media in general can be interpreted as a tool or means of communication to convey information from one party to another. With the learning media animation can facilitate learning basic shooting techniques in basketball games (Samsudin, 2018). This is proven through calculations via T-test below. T-test calculation of shooting skills states that there are notable differences between the experimental group and the control group. The form of learning in this study is learning through animation media, this can be seen in the T statistical test in the final test. So there is a very significant difference between groups who do learning with animation media with groups that are not given learning with animated media and the frequency of learning sessions that are quite consistent are also important factors in helping students master shooting techniques better. Based on previous research, The application and development of technology in educational programs can enhance both the quality of learning and athletic performance, ultimately leading to improved overall performance (Dyer, 2015). Other studies indicate that technological advancements can serve as a tool for monitoring physical activity, learning progress, and collecting comprehensive and detailed data. This enables the evaluation of learning strategies in a more objective manner and offers new insights into how knowledge can be applied effectively (Passfield & Hopker, 2017). This learning tool was created as a form of learning tool innovation in basketball, especially in passing skills. Technological innovation related to sports science and improvement in the field is often seen positively, with many sports organizations that are now looking for competitive advantage through innovation (Ringuet-Riot et al., 2013). In line with previous research which states using animated video in the learning process to facilitate student comprehension and engagement (Sukarini & Manuaba, 2021).

The characteristics of elementary school children in general are very happy visuals that are interesting and intractive, like to play, and like to feel or do something directly (Widiyatmoko & Hudah, 2017) . Therefore, the attractiveness of learning media will be able to increase student enthusiasm in learning. The use of learning media in accordance with the characteristics of students as a learning stimulus tool that helps arouse curiosity, student motivation, so that learning can be achieved optimally (Pane & Darwis Dasopang, 2017). Animated video developed can motivate students in learning and can make it easier for students to understand the material well. Elementary students generally tend to be quickly bored when participating in learning resulting in lack of motivation when learning so that with the presence of animated video media that matches the characteristics of students, this video is able to increase student enthusiasm when participating in learning. In designing effective learning media, it must meet several conditions such as media made simple, easy to understand, interesting so that students are motivated to learn (Arfi et al., 2024; Ockta et al., 2024; Pitnawati et al., 2023). Animated video is designed with an attractive display of moving images and interesting colors in the animated video so that it suits the character of elementary students. Elementary students who tend to be more interested in moving things that result in students want to know the causes of something. This is one of the basic considerations of the choice of video media with animation as its main element (Griffin, 2019). explains that colors and images can attract attention and increase student learning motivation. In terms of content, the material in this animated video is in accordance with basic competencies, indicators, learning objectives. Furthermore, the alignment of animated video media with the characteristics of elementary students and the content being presented makes it easier to understand. When the media matches

both the material and the students' characteristics, it enhances their ability to absorb the information effectively (Afandi, 2015). The suitability of the mediand material with basic competencies. Indicators and goals is a very important thing from the development of this animated video.

Basic competencies are the abilities that must be mastered by participants are discussed after they carry out learning. In the implementation of the learning process, basic competencies become an important reference for how far and how deep the material must be delivered by a teacher to students given the limitations of the ability of the brain in processing information (Diani & Hartati, 2018). Interesting illustrations can also make it easier for students to understand learning material (Podder et al., 2021). Students need various interesting learning strategies to achieve optimal results. With the presentation of material with illustrations and examples that are packaged with interesting through a combination of images, text, animation and unur interaction with students make students actively involved and increasingly motivated in the learning process. In the use of learning media not only at the point of focusing on the goals and content of learning media, but it is also necessary to consider other factors that play a role in the use of media such as student characteristics, models or learning strategies, time allocation, facilities and infrastructure, and so on (Silmi & Rachmadyanti, 2018). Previous research findings state that animated videos can increase interest and motivation in learning because of their interesting presentation (Das et al., 2014). Other research findings also stated that animated videos can improve student learning outcomes (Warren & Adams, 2006). Therefore, based on the results of the research and data processing above, that the results of the hypothesis test obtained significant differences (significant) in the experimental group and in the control group before and after treatment. However, in the experimental group there are higher differences in meaning or significant levels compared to the control group, this is because in the experimental group treatment is carried out by providing learning media in the form of animated media given during the study which makes students more motivated in receiving and listening to learning using animation media. Through the use of animated media, the experimental group can observe, try, communicate or discuss, and apply the stages of the basic motion of shooting contained in the contents of the animated video given properly and correctly.

Based on the research process and data analysis, the hypothesis test results show a significant difference between the experimental group and the control group before and after treatment. However, the experimental group exhibited a higher significant difference compared to the control group. This is because the experimental group received treatment using animated learning media during the study, which increased students' motivation to receive and engage with the lessons. Through the use of animated media, students in the experimental group were able to observe, practice, communicate or discuss, and apply the basic stages of shooting motion in basketball as presented accurately in the animated video content. These findings align with multimedia learning theory, which states that interactive visual media can enhance student motivation and understanding (Schrader & Rapp, 2016). Additionally, research by Vako et al. (2023) supports that the use of animated media can improve basic motor skills in sports. The main difference between this study and previous research lies in its focus on using animated media specifically for teaching basketball shooting skills to extracurricular students at Cimahi Mandiri 2, whereas previous studies have been more general in sports or other learning media. Therefore, the specific finding of this research indicates that animated media effectively improves students' shooting skills significantly compared to learning methods without animated media.

CONCLUSIONS AND SUGGESTIONS

Conclusions based on the results of processing and data analysts that have been carried out in the previous chapter, the authors draw some conclusions as follows: 1. Animation media has a significant (significant) influence on increasing the results of shooting learning results in basketball games in children aged 10-11 years. 2. Learning media without the use of animated media has a significant (significant) influence on increasing the results of shooting learning

(shooting) in basketball games in children aged 10-11 years. 3. Learning using animation media provides more significant effectiveness than learning without the use of animation media on increasing learning outcomes (shooting) in basketball games in children aged 10-11 years. Subsequent research can explore the use of animated media in improving psychological aspects, such as self -confidence and concentration. In addition, examining the effect of the duration and frequency of animation exposure to shooting learning outcomes can also provide insight. The limitations of this study include a limited sample in children aged 10-11 years in one location, relatively short duration of intervention, and limitations in controlling external factors such as the physical condition of participants and previous experience. Further research could examine the application of animation media in other sports to see its effectiveness in developing athletic skills more generally.

Based on the results of this study, it is recommended that future research explore the use of animated media to improve psychological aspects of learners, such as self-confidence and concentration, as these factors play an important role in the learning process and sports performance. Additionally, future studies could examine the effects of the duration and frequency of exposure to animated media on shooting learning outcomes to determine the optimal usage dosage. It is also advisable to conduct research with more diverse samples and in different locations to enhance the generalizability and provide a more comprehensive understanding of the findings. Controlling external factors such as participants' physical condition and prior experience should also be considered to improve the validity of the results. Furthermore, future research may apply animated media in other sports to evaluate its effectiveness in developing athletic skills more broadly.

REFERENCES

Abizar, M., Sapulete, J. J., & Fauzi, M. S. (2021). Pengembangan Model Permainan Bola Voli "Voli Target (Vorget)" Dalam Pembelajaran Penjasorkes Pada Siswa Kelas VIII SMP Negeri 3 Kuaro. *Borneo Physical Education Journal*, *2*(2), 38–49. https://doi.org/10.30872/bpej.v2i2.699

Afandi, R. (2015). Pengembangan Media Pembelajaran Permainan Ular Tangga Untuk Meningkatkan Motivasi Belajar Siswa dan Hasil Belajar IPS di Sekolah Dasar. *JINoP (Jurnal Inovasi Pembelajaran)*, *1*(1), 77. https://doi.org/10.22219/jinop.v1i1.2450

Antika, H., Priyanto, W., & Purnamasari, I. (2019). Pengaruh Penggunaan Media Animasi Sandisko Dengan Model Somatic Auditory Visualization Intellectually Terhadap Hasil Belajar Tema Kebersamaan Kelas 2. *Mimbar Ilmu*, *24*(2), 247. https://doi.org/10.23887/mi.v24i2.21288

Arfi, J., Wahyuri, A. S., Gusril, G., Rasyid, W., & Ockta, Y. (2024). Developing Engaging Audio-Visual Learning Media For Basic Locomotor Patterns Through Play-Based Activities For Early Learners. *Journal of Education, Teaching, and Learning*, *9*(1), 40–46. https://journal.stkipsingkawang.ac.id/index.php/JETL/article/view/5922

Baldwin, C. F. (2015). First-year physical education teachers' experiences with teaching African refugee students. *SAGE Open*, *5*(1). https://doi.org/10.1177/2158244015569737

Bogdanis, G. C., Ziagos, V., Anastasiadis, M., & Maridaki, M. (2007). Effects of two different short-term training programs on the physical and technical abilities of adolescent basketball players. *Journal of Science and Medicine in Sport*, *10*(2), 79–88. https://doi.org/10.1016/j.jsams.2006.05.007

Bulkani, F. M., Adella, H., & Andi Setiawan, M. (2022). Development of animation learning media based on local wisdom to improve student learning outcomes in elementary schools. *International Journal of Instruction*, *15*(1), 55–72. https://doi.org/10.29333/iji.2022.1514a

Das, R., Ali, M. E., Hamid, S. B. A., Ramakrishna, S., & Chowdhury, Z. Z. (2014). Carbon nanotube membranes for water purification: A bright future in water desalination. In *Desalination* (Vol. 336, Issue 1, pp. 97–109). https://doi.org/10.1016/j.desal.2013.12.026

Diani, R., & Hartati, N. S. (2018). Flipbook berbasis literasi Islam: Pengembangan media pembelajaran fisika dengan 3D pageflip professional. *Jurnal Inovasi Pendidikan IPA*, *4*(2), 234–244. https://doi.org/10.21831/jipi.v4i2.20819

Diyana, T. N., Supriana, E., & Kusairi, S. (2020). Pengembangan multimedia interaktif topik prinsip Archimedes untuk mengoptimalkan student centered learning. *Jurnal Inovasi Teknologi Pendidikan*, *6*(2), 171–182. https://doi.org/10.21831/jitp.v6i2.27672

Saichudin, S., & Munawar, S. A. R. (2019). *Buku Ajar Bolabasket*. Wineka Media. https://fik.um.ac.id/wp-content/uploads/2020/10/14.-BUKU-AJAR-BOLABASKET.pdf

Dyer, B. (2015). The controversy of sports technology: a systematic review. *SpringerPlus*, *4*(1). https://doi.org/10.1186/s40064-015-1331-x

El, M., & Lanos, C. (2024). Development of interactive manipulative motion learning media using adobe animate for elementary school students. *Jurnal Keolahragaan*, *12*(2), 184–194. https://doi.org/10.21831/jk.v12i2.76328

Griffin, T. R. (2019). National identity, social legacy and Qatar 2022: the cultural ramifications of FIFA's first Arab World Cup. *Soccer and Society*, *20*(7–8), 1000–1013. https://doi.org/10.1080/14660970.2019.1680499

Hadi, W., Yuksafa, R., Yarmi, G., Safitri, D., Lestari, I., Suntari, Y., Umasih, Marini, A., Sudrajat, A., & Iskandar, R. (2022). Enhancement of Students' Learning Outcomes through Interactive Multimedia. *International Journal of Interactive Mobile Technologies*, *16*(7), 82–98. https://doi.org/10.3991/ijim.v16i07.25825

Harefa, E., & Gulo, H. (2024). Three-Dimensional Science Animation Implementation and Spatial Ability for Science Concept Reconstruction: A Gender-Based Education Study. *JPI (Jurnal Pendidikan Indonesia)*, *13*(1), 24–34. https://doi.org/10.23887/jpiundiksha.v13i1.68005

Haryanto, A. D. (2021). Pengembangan Media Pembelajaran Bola Voli Untuk Siswa Sekolah Kejuruan. *Jambura Journal of Sports Coaching*, *3*(1), 23–32. https://ejurnal.ung.ac.id/index.php/jjsc/article/view/9627

Huljannah, M., & Idrus, Y. (2020). Pengaruh Penggunaan Media Animasi Pada Pembuat Pola Dasar Badan Wanita Terhadap Motivasi Belajar Siswa Kelas X Mata Pelajaran Pola Dasar Tata Busana SMK NEGERI 3 Payakumbuh. *Jurnal Kapita Selekta Geografi*, *3*(3), 1-12. https://doi.org/10.24036/KSGEO.V3I3.404

Wulansari, D. (2014). *IMPLEMENTASI MODEL TEACHING PERSONAL AND SOCIAL RESPONSIBILITY (TPSR) DAN MODEL TRADISIONAL DALAM PENJASORKES UNTUK MENINGKATKAN SELF EFFICACY PESERTA DIDIK*. S2 thesis, Universitas Pendidikan Indonesia. https://repository.upi.edu/6515

Knapp, P., Benhebil, N., Evans, E., & Moe-Byrne, T. (2022). The effectiveness of video animations in the education of healthcare practitioners and student practitioners: a systematic review of trials. *Perspectives on Medical Education*, *11*(6), 309–315. https://doi.org/10.1007/s40037-022-00736-6

Kosasih, D. (2008). *Fundamental Basketball A First Step To Success*. Karangturi Media. https://digilib.unsil.ac.id/index.php?p=show_detail&id=11610

Li, J., Zhang, K., & Zhang, H. (2018). Adsorption of antibiotics on microplastics. *Environmental Pollution*, *237*, 460–467. https://doi.org/10.1016/j.envpol.2018.02.050

Marmarinos, C., Apostolidis, N., Kostopoulos, N., & Apostolidis, A. (2016). Efficacy of the "pick and roll" offense in top level European basketball teams. *Journal of Human Kinetics*, *50*(2), 121–129. https://doi.org/10.1515/hukin-2015-0176

McKenzie, T. L., & McKenzie, T. L. (2007). The preparation of physical educators: A public health perspective. *Quest*, *59*(4), 345–357. https://doi.org/10.1080/00336297.2007.10483557

Newland, A., Newton, M., Finch, L., Harbke, C. R., & Podlog, L. (2013). Moderating variables in the relationship between mental toughness and performance in basketball. *Journal of Sport and Health Science*, *2*(3), 184–192. https://doi.org/10.1016/j.jshs.2012.09.002

Ockta, Y., Umar, U., Komaini, A., Firdaus, K., Padli, P., & Masrun, M. (2024). Walk, run, jump and learn: Interactive multimedia for teaching locomotor skills in primary schools. *Research and Development in Education (RaDEn)*, *4*(1), 1–11. https://doi.org/10.22219/raden.v4i1.31831

Pane, A., & Darwis Dasopang, M. (2017). Belajar Dan Pembelajaran. *FITRAH:Jurnal Kajian Ilmu-Ilmu Keislaman*, *3*(2), 333. https://doi.org/10.24952/fitrah.v3i2.945

Pasaribu, A. M. N. (2023). Electronic Sports (E-Sports): a Global Phenomenon Affecting Sports Culture. *Riyadhoh: Jurnal Pendidikan Olahraga*, *6*(2), 190. https://doi.org/10.31602/rjpo.v0i0.13132

Passfield, L., & Hopker, J. G. (2017). A mine of information: can sports analytics provide wisdom from your data?. *International journal of sports physiology and performance*, *12*(7), 851-855. https://doi.org/10.1123/ijspp.2016-0644

Pitnawati, Damrah, Handayani, S. G., Putra, A. N., Sasmitha, W., Nelson, S., Wulandari, I., Angelia, L., Ningsih, M. S., & Ockta, Y. (2023). Development of direct and indirect assistance approach using jigsaw method and android-based digital design method for gymnastic materials. *Journal of Physical Education and Sport*, *23*(12), 3292–3298. https://doi.org/10.7752/jpes.2023.12376

Podder, A., Sadmani, A. H. M. A., Reinhart, D., Chang, N. Bin, & Goel, R. (2021). Per and poly-fluoroalkyl substances (PFAS) as a contaminant of emerging concern in surface water: A transboundary review of their occurrences and toxicity effects. In *Journal of Hazardous Materials* (Vol. 419). https://doi.org/10.1016/j.jhazmat.2021.126361

Pojskić, H., Šeparović, V., Muratović, M., & Uièanin, E. (2014). The relationship between physical fitness and shooting accuracy of professional basketball players. *Motriz. Revista de Educacao Fisica*, *20*(4), 408–417. https://doi.org/10.1590/S1980-65742014000400007

Silmi, M. Q., & Rachmadyanti, P. (2018). *Pengembangan media pembelajaran video animasi berbasis sparkol videoscribe tentang persiapan kemerdekaan RI SD kelas V* (Doctoral dissertation, State University of Surabaya). https://ejournal.unesa.ac.id/index.php/jurnal-penelitian-pgsd/article/view/23611

Raiola, G., & D'isanto, T. (2016). Descriptive shot analysis in basketball. *Journal of Human Sport and Exercise*, *11*(Proc1), S259–S266. https://doi.org/10.14198/jhse.2016.11.Proc1.18

Ramadhan, M. S., Jalinus, N., Refdinal, Mulyani, N., & Amin, M. (2024). Development of Hybrid Project-Based Learning Model for Multimedia Technology and Animation. *International Journal of Information and Education Technology*, *14*(5), 690–699. https://doi.org/10.18178/ijiet.2024.14.5.2094

Ringuet-Riot, C. J., Hahn, A., & James, D. A. (2013). A structured approach for technology innovation in sport. *Sports Technology*, *6*(3), 137–149. https://doi.org/10.1080/19346182.2013.868468

Safitri, D., Lestari, I., Maksum, A., Ibrahim, N., Marini, A., Zahari, M., & Iskandar, R. (2021). Web-Based Animation Video for Student Environmental Education at Elementary Schools. *International Journal of Interactive Mobile Technologies*, *15*(11), 66–80. https://doi.org/10.3991/ijim.v15i11.22023

Samsudin. (2018). *Pembelajaran Pemdidikan Jasmani Olahraga Dan Kesehatan SMP/MTs*. Litera Pranada Media Grup. https://opac.upgripnk.ac.id/index.php?p=show_detail&id=2549&keywords=

Sari, D. N. (2017). Analisis Kemampuan Footwork Tenis Meja Mahasiswa UKO Tenis Meja Universitas Negeri Padang. *Sport Science*, *17*(2), 101-107. https://doi.org/10.24036/jss.v17i2.42

Schrader, P. G., & Rapp, E. E. (2016). Does multimedia theory apply to all students? The impact of multimedia presentations on science learning. *Journal of Learning and Teaching in Digital Age*, *1*(1), 32-46. https://dergipark.org.tr/en/pub/joltida/issue/55462/760056

Singh, Pankaj Kumar, & Ozarkar, Anantkumar. (2024). Use of Animation in Design Education—A Review of Literature. *International Journal of Educational Reform*, 10567879241278684. https://doi.org/10.1177/10567879241278685

Stadlinger, B., Jepsen, S., Chapple, I., Sanz, M., & Terheyden, H. (2021). Technology-enhanced learning: a role for video animation. *British Dental Journal*, *230*(2), 93–96. https://doi.org/10.1038/s41415-020-2588-1

Struzik, A., Pietraszewski, B., & Zawadzki, J. (2014). Biomechanical analysis of the jump shot in basketball. *Journal of Human Kinetics*, *42*(1), 73–79. https://doi.org/10.2478/hukin-2014-0062

Suharta, A., Endriani, D., Dewi, R., & Supriadi, A. (2022). Development of Volleyball Game Model Using Learning Media. *Kinestetik: Jurnal Ilmiah Pendidikan Jasmani*, *6*(2), 271–278. https://doi.org/10.33369/jk.v6i2.21636

Sukarini, K., & Manuaba, I. B. S. (2021). Pengembangan Video Animasi Pembelajaran Daring Pada Mata Pelajaran IPA Kelas VI Sekolah Dasar. *Jurnal Edutech Undiksha*, *9*(1), 48–56. https://doi.org/10.23887/jeu.v9i1.32347

Tolgfors, B., & Öhman, M. (2015). The implications of assessment for learning in physical education and health. *European Physical Education Review*, *22*(2), 150–166. https://doi.org/10.1177/1356336X15595006

Tresnakova, N., Famulari, S., Zicarelli, G., Impellitteri, F., Pagano, M., Presti, G., Filice, M., Caferro, A., Gulotta, E., Salvatore, G., Sandova, M., Vazzana, I., Imbrogno, S., Capillo, G., Savoca, S., Velisek, J., & Faggio, C. (2023). Multi-characteristic toxicity of enantioselective chiral fungicide tebuconazole to a model organism Mediterranean mussel Mytilus galloprovincialis Lamarck, 1819 (Bivalve: Mytilidae). *Science of the Total Environment*, *862*. https://doi.org/10.1016/j.scitotenv.2022.160874

Vako, I. I., Grygus, I. M., & Nikitenko, O. V. (2023). the Use of Modern Multimedia Resources in the Practice of Sports and Physical Education. *Rehabilitation and Recreation*, *2023*(14), 258–268. https://doi.org/10.32782/2522-1795.2023.14.31

Warren, C. R., & Adams, M. A. (2006). Internal conductance does not scale with photosynthetic capacity: Implications for carbon isotope discrimination and the economics of water and nitrogen use in photosynthesis. *Plant, Cell and Environment*, *29*(2), 192–201. https://doi.org/10.1111/j.1365-3040.2005.01412.x

Wasserman, E. B., Herzog, M. M., Collins, C. L., Morris, S. N., & Marshall, S. W. (2018). Fundamentals of Sports Analytics. *Clinics in Sports Medicine*, *37*(3), 387–400. https://doi.org/10.1016/j.csm.2018.03.007

Widiyatmoko, F. A., & Hudah, M. (2017). Evaluasi Implementasi Pendidikan Nilai Dalam Pembelajaran Penjas. *Jurnal Ilmiah Penjas*, *3*(2), 44–60. https://ejournal.utp.ac.id/index.php/JIP/article/view/587

Wissel, H. (2012). *Steps to success Basketball*. https://www.amazon.com/Basketball-Steps-Success-Sports/dp/1450414885

Wissel, H. (2018). *Basketball: Step to Success* (Third Edit). Human Kinetics. https://www.amazon.com/Basketball-Steps-Success-Sports/dp/1450414885

Wulandari, A. (2014). Karakteristik pertumbuhan perkembangan remaja dan implikasinya terhadap masalah kesehatan dan keperawatannya. *Jurnal Keperawatan Anak*, *2*(1), 39-43. https://jurnal.unimus.ac.id/index.php/jka/article/view/3954

Zambová, D., & Tománek, Ľ. (2012). Efficiency shooting program for youth basketball players. *Sportlogia*, *8*(1), 87–92. https://doi.org/10.5550/sgia.120801.en.087z