COMPETITOR:
JURNAL PENDIDIKAN KEPELATIHAN OLAHRAGA
e-ISSN: 2657-0734 & p-ISSN: 2085-5389 ‖ Volume 18, Number 1, 2026 ‖ P.0365-0378

Development of Overhead Serve Learning Media in Volleyball Using Canva

Muhammad Khadafi Mulva[1A-E*], Destriani[2B-D], Reza Resah Pratama[3B-D], Herri Yusfi[4B-D]

[1,2,3,4] Universitas Sriwijaya, Sumatera Selatan, Indonesia

khadafimulfva7@gmail.com[1*], destriani@fkip.unsri.id[2], rezaresahpratama@fkip.unsri.id[3], herriyusfi@fkip.unsri.id[4]

ABSTRACT

This study aimed to develop and evaluate the effectiveness of Canva-based overhead serve learning media for volleyball instruction at State Senior High School 17 Palembang. The research was grounded in the need for innovative and visually oriented learning media to support the mastery of complex motor skills in Physical Education (PJOK), particularly in volleyball serving techniques. A Research and Development (R&D) approach was employed using a simplified six-stage model consisting of needs analysis, design, design validation, development, implementation, and evaluation. The developed product was an animated instructional video with a duration of 15 minutes and 10 seconds, a resolution of 720p, and a file size of 33.4 MB. The content integrated volleyball history, basic rules of the game, and systematic explanations of overhead serve techniques using clear visualizations. Media feasibility was assessed through expert validation involving content experts, media experts, and teacher validators. The validation results indicated high feasibility, with scores of 88.89% from content experts, 73.3% from media experts, and 80% from teacher validators, suggesting that the media was suitable for implementation with minor revisions. To examine effectiveness, a limited-scale trial was conducted with 36 Grade X students. The findings revealed a significant improvement in students' learning outcomes, as reflected by an increase in the average score from 79.89 on the pretest to 90.77 on the posttest. The calculated N-Gain value of 0.54 fell within the moderate category, indicating a meaningful learning improvement. Overall, the results demonstrate that Canva-based overhead serves learning media is effective in enhancing students' learning outcomes, engagement, and innovation in volleyball instruction within Physical Education classes.

ARTICLE HISTORY
Received: 2026/01/13
Accepted: 2026/01/23
Published: 2026/02/08

KEYWORDS
Overhead Serve;
Volleyball Learning Media;
Canva;
Physical Education;
Research and Development.

AUTHORS' CONTRIBUTION
A. Conception and design of the study;
B. Acquisition of data;
C. Analysis and interpretation of data;
D. Manuscript preparation;
E. Obtaining funding

Cites this Article : Mulva, M.K.; Destriani, D.; Pratama, R.R.; Yusfi, H. (2026). Development of Overhead Serve Learning Media in Volleyball Using Canva. **Competitor: Jurnal Pendidikan Kepelatihan Olahraga**. 18 (1), p.0365-0378

INTRODUCTION

Volleyball is a very popular sport in Indonesia, particularly in the context of physical education in secondary schools, both as a curricular and extracurricular activity (Destriani et al., 2021; Kuswanto & Radiansah, 2018). This popularity demands effective and relevant basic technique instruction for 21st-century students. However, the practice of physical education (PJOK) teaching in schools still faces several fundamental challenges, particularly in mastering basic volleyball techniques, one of which is the overhead serve. The overhead serve is a fundamental skill that determines the rhythm of the game, team strategy, and direct scoring opportunities (Suharno, 2016; Aip Syarifuddin & Muhadi, 2017). Ironically, this

skill is often not taught optimally and systematically and tends to be marginalized in physical education teaching practices in schools.

This problem is exacerbated by a learning approach that is still dominated by conventional, teacher-centred methods and minimal use of visual media and digital technology. As a result, students experience difficulty understanding the movement stages, eye-hand coordination, and proper timing when executing an overhead serve (Destriana et al., 2020). Empirically, learning volleyball techniques without adequate visual aids results in low accuracy, power, and confidence in serving (Evionora et al., 2018; Ramli et al., 2018). This situation indicates a gap between the competency demands of modern Physical Education (PJOK) learning and practical learning.

On the other hand, the development of digital technology has opened up significant opportunities for innovation in PJOK learning media that are more interactive, contextual, and student-centred (Kartika et al., 2022). Unfortunately, the use of technology-based media in teaching volleyball serving techniques is still very limited and has not been systematically integrated into PJOK learning designs. Therefore, efforts are needed to develop and utilize innovative learning media that can bridge the complexity of overhead serve movements with the visual and digital-native learning characteristics of students.

Current literature shows that the quality of physical education (PJOK) learning is greatly influenced by the use of appropriate and contextual learning media. Learning media is defined as any tool, medium, or technology used to convey learning messages so as to stimulate students' attention, motivation, and understanding (Sadiman et al., 2015; Arsyad, 2017). In the context of PJOK, visual media such as sequential images, slow-motion videos, and infographics have proven effective in explaining complex motor skills (Ramli et al., 2018; Andini et al., 2024).

Several studies over the past decade have confirmed that visual and digital media-based sports technique learning can improve students' understanding of movement concepts, motor skills, and learning motivation (Destriana et al., 2020; Kartika et al., 2022). Gagné and Briggs' learning theory positions media as a crucial stimulus that facilitates students' cognitive and psychomotor processes, enabling learning outcomes to be observed through changes in behaviour and skills (Destriana, Destriani, & Yusfi, 2020).

One digital medium that is rapidly developing in education is Canva. Canva is an online design platform that provides a variety of visual templates for presentations, posters, infographics, and interactive learning materials (Resmini et al., 2021; Rahmatullah et al., 2020). Recent research shows that Canva effectively enhances teacher creativity, the visual quality of teaching materials, and student engagement in the learning process (Triningsih, 2021; Melinda & Saputra, 2021). In Physical Education (PJOK) learning, Canva allows for systematic, engaging, and easy-to-understand visualization of sports movement stages (Rahmayanti & Jaya, 2020; Adawiyah et al., 2019).

Empirically, interactive visual media contributes positively to improving basic sports technical skills, including accuracy and power, as well as student confidence (Evionora et al., 2018; Mila et al., 2021). However, most studies still focus on theoretical subjects or non-motor skills, while empirical research on the specific use of Canva for volleyball serve learning in schools is relatively limited.

Although numerous studies have examined the effectiveness of digital and visual learning media in physical education, several significant research gaps remain. First, the majority of studies position Canva as a general learning medium without specific designs based on sports technique motion analysis, thus failing to address the biomechanical and motor coordination needs of the volleyball overhead serve skill. Second, previous research has focused primarily on student motivation and perception, while the measurable impact of Canva on improving psychomotor skills (serve accuracy and power) remains minimal.

Third, few studies have integrated Canva's media development with the principles of gradual and systematic motor learning that align with the characteristics of secondary school students. Fourth, the context of physical education learning in Indonesia, with its limited resources and varying teacher competencies, rarely serves as the primary empirical setting for technology-based learning media research. Therefore, research is needed that not only tests the effectiveness of Canva as a visual medium but also constructs a learning model for the volleyball overhead serve based on the actual needs of physical education learning in schools.

Based on these research problems and gaps, this study aims to develop and test the effectiveness of Canva-based volleyball overhand serve learning media in improving students' movement comprehension, psychomotor skills, and learning motivation in Physical Education (PJOK) learning. Specifically, this research aims to (1) design Canva media that visualizes the stages of the overhand serve technique systematically and pedagogically, and (2) analyze its impact on the quality of student learning outcomes.

The novelty of this research lies in the integration of Canva's visual design with motor learning principles and the technical requirements of the volleyball overhand serve, which have not been widely explored in previous research. Furthermore, this study positions Canva not merely as a presentation tool, but as a visual literacy-based technical learning medium specifically designed for the context of PJOK. Therefore, the results of this study are expected to provide theoretical contributions to the development of technology-based sports learning media, as well as practical contributions for PJOK teachers in improving the quality of volleyball instruction that adapts to the demands of the digital era.

METHODS

This study employed a research and development (R&D) approach aimed at developing, validating, and testing the effectiveness of Canva-based overhead serve learning media for volleyball instruction at the senior high school level. The R&D design was selected because it is appropriate for producing educational products that are empirically tested and pedagogically feasible in real learning contexts (Borg & Gall, 2003; Richey & Klein, 2014). This approach has been widely applied in physical education research to develop instructional media and learning models that integrate motor learning principles and digital technology (Akpinar, 2019; Kartika et al., 2022).

The study was conducted at State Senior High School 17, Palembang, Indonesia, located on Jalan Mayor Zurbi Bustan, Palembang City. Data collection and product trials were carried out from May 5 to May 19, 2025, aligning with the regular Physical Education

learning schedule to ensure ecological validity. The research subjects consisted of two expert validators and students participating in a limited-scale field trial. The expert validators included one material expert and one media expert, both lecturers in Physical Education, Health, and Recreation, who possess academic and practical expertise in volleyball instruction and educational media development. Expert validation is a critical stage in R&D studies to ensure content accuracy, instructional clarity, and media usability before field implementation (Branch, 2018; Sugiyono, 2019).

The limited-scale trial involved 36 tenth-grade students, selected to represent the target user group of the developed learning media. Small-group trials are recommended in educational R&D to identify usability issues, clarity of instructions, and initial effectiveness before broader implementation (Plomp & Nieveen, 2013; Triningsih, 2021). The students participated voluntarily and were accustomed to basic volleyball learning, ensuring that the media was tested within an authentic instructional context.

The development procedure followed the Borg and Gall R&D model, which consists of ten systematic stages: (1) research and initial information gathering through literature review and needs analysis; (2) planning and defining learning objectives; (3) developing the initial Canva-based media prototype; (4) conducting initial field testing on a small scale; (5) revising the main product based on expert and user feedback; (6) conducting main field trials; (7) revising the operational product; (8) operational field testing to examine practicality and effectiveness; (9) final product revision; and (10) dissemination and implementation (Borg & Gall, 2003; Richey & Klein, 2014). In this study, the focus was placed on stages up to limited-scale field testing to ensure product feasibility and instructional quality.

Data were collected using expert validation sheets, student response questionnaires, and observation guidelines. These instruments were designed to assess content validity, media quality, visual clarity, ease of use, and learning relevance, following recommendations for instructional media evaluation in physical education (Arsyad, 2017; Ramli et al., 2018; Andini et al., 2024). Data analysis was conducted descriptively using percentage-based interpretations to determine validity, practicality, and initial effectiveness, as commonly applied in R&D-based educational studies (Sugiyono, 2019; Resmini et al., 2021). The methodological design ensures that the developed Canva-based learning media are pedagogically sound, practically applicable, and aligned with contemporary digital learning demands in physical education.

RESULTS AND DISCUSSION

Result

This research aims to produce an animated learning video as a supporting medium for Physical Education (PJOK) learning, specifically for the upper serve skill material in volleyball. The following are the results of the media development that has been carried out. stage This produces a formulation about objective manufacturing media. Media. This is formulated basically as a medium that introduces overhead service movement skills in volleyball, with the Independent Curriculum being able to coordinate movement, throw the ball And hit it with the palm hand properly, accompanied by a balanced body position.

Muhammad Khadafi Mulva[1A-E*], Destriani[2B-D], Reza Resah Pratama[3B-D], Herri Yusfi[4B-D]
khadafimulfva7@gmail.com[1*]

Figure 1.
Results response teacher from various schools through Google Form

An assessment of the learning media "Development of Volleyball Overhead Serve Learning Media Using Canva at SMA Plus Negeri 17 Palembang" was obtained from 33 teacher respondents from various schools in Palembang City and its surrounding areas. The teachers included Physical Education, Sports, and Health (PJOK) teachers at the high school/vocational high school level. The results indicate that the media needs further development.

During the material validation stage, the lecturer will conduct a validation test to determine the feasibility of the product. This product test is divided into two categories: material validation and media validation. This aims to determine whether the development of the volleyball upper service learning media using animated videos through the Canva application is suitable for use in schools to assist students in the learning and teaching process in today's era. The following is an explanation.

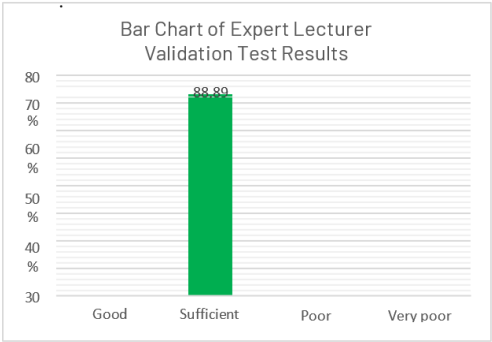

Figure 2.
Diagram Results Test Validation Lecturer Expert Material

Table 1.
Score Categories

Score%	Category
91 - 100	Good
66 - 90	Enough
41- 65	Not enough
0 - 40	Very not enough

After obtaining the percentage data As can be seen in the table above, the score rating scale is 88.89%. The researcher modified the feasibility rating scale to accommodate the data. Quantitative and quality perception Which given by the validator. Based on the assessment results on sheet questionnaire. Expert material give sign tick

Muhammad Khadafi Mulva[1A-E*], Destriani[2B-D], Reza Resah Pratama[3B-D], Herri Yusfi[4B-D]
khadafimulfva7@gmail.com[1*]

on the description option is "sufficient." Thus, the development of service learning media using Canva can be used as an alternative learning support, but there is still room for further improvement to achieve the "good" category.

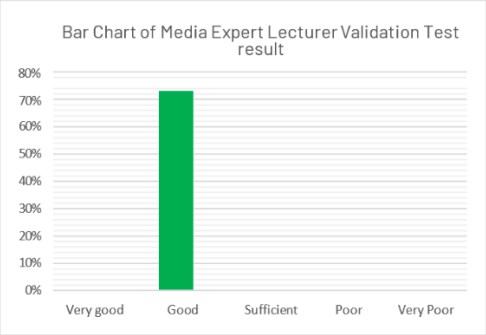

Figure 3.
Diagram Results Test Validation Lecturer Expert Media

Table 2.
Score Categories

Score%	Category
81 - 100	Very Good
61 - 80	Good
41 - 60	Enough
21 - 40	Not enough
≤ 20	Very not enough

After obtaining the data percentage, it can be seen on table scale evaluation Score. Canva-based video learning media obtained a score of 73.3%**,** which is categorised as "Good"**.** This category refers to the opinion of Riduwan (2015)**,** who stated that a percentage score between 61 - 80% is included in the good category data.

Table 3.
Trial Results Student Pretest Media Test

No	School	Number of Students	Total Value	Average value	Presentation	Category
1	High School Plus Country 17 Palembang	36	3268	90.77	90.77%	Very Good

Based on the table above, if displayed in the form of a bar chart according to Kurniawan's statement (2018), the results of the pretest trial are in the following image:

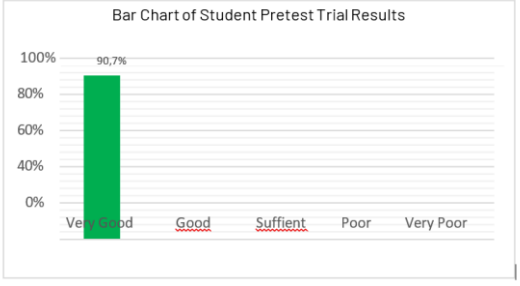

Figure 4.
Diagram Results Test Try Test Pretest Participant Educate

Muhammad Khadafi Mulva[1A-E*], Destriani[2B-D], Reza Resah Pratama[3B-D], Herri Yusfi[4B-D]
khadafimulfva7@gmail.com[1*]

Table 4.
Score categories

Score%	Category
81 - 100	Very Good
61 - 80	Good
41 - 60	Enough
21 - 40	Not enough
≤ 20	Very not enough

The media trial was conducted on 36 10th-grade students of SMA Plus Negeri 17 Palembang. The implementation of the learning media for the upper serve in volleyball was carried out in one meeting. The learning activity began with the presentation of the material about technique-based service, Then to be continued by conducting a practical test on serving techniques for volleyball on the court by students. After completing the test, students were asked to fill out a prepared assessment questionnaire. Researchers use get a response to the learning media used. The results of media testing through posttests are presented as follows:

Table 5.
Results Test Try Test Student Posttest

School	Number of Participants Educate	Total Valeu	Average Value	Presentation	Category
Senior High School Plus Country 17 Palembang	36	2876	79.89	79%	Good

Based on the table above, if displayed in the form of a bar chart according to Kurniawan's statement (2018), the results of the post-test trial are in the following image:

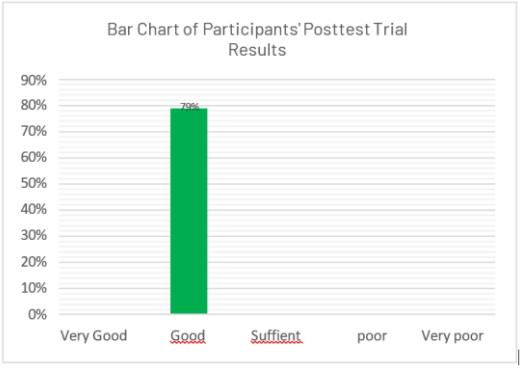

Figure 5.
Diagram Test Results Try Test Posttest Participant Educate

Table 6.
Score categories

Score%	Category
81 - 100	Very Good
61 - 80	Good
41 - 60	Enough
21 - 40	Not enough
≤ 20	Very not enough

Muhammad Khadafi Mulva[1A-E*], Destriani[2B-D], Reza Resah Pratama[3B-D], Herri Yusfi[4B-D]
khadafimulfva7@gmail.com[1*]

The upper service media in volleyball was carried out in one meeting. The learning activity began with the delivery of material about the technique service in ball volleyball, and the students were given questions to determine their initial understanding. After answering the questions, the students are asked to fill out the assessment questionnaire that has been prepared by researchers using GetResponse for media learning Which used. The results of media testing through the pretest are presented as follows.

Media effectiveness. The research results show that the developed learning media have proven effective in supporting students' learning processes. The media's effectiveness is evident in increased understanding of the material, student interest in the visual display, and ease of access and use. Canva, as a digital medium, allows Teacher For create an atmosphere Study Which more fun, so that students are more active in following the PJOK learning process (Glennada et al., 2025). Media. This not only facilitates delivery of material, but also increases involvement of active participant educate in the process. Learning: The results of the pretest and posttest are attached below:

Table 7.
Results of the pre-test and post-test of students

Scale	Information (Mark)	Frequency	Percentage
SB	Very Good (86 - 100)	17	47.2%
B	Good (76 - 85)	9	25.0%
C	Enough (66 - 75)	6	16.7%
K	Not enough (56 - 65)	3	8.3%
SK	Very Not enough <55	1	2.8%
		36	100.0%

Based on the posttest results of 36 students in class X9, the total score was 2876. To determine the average score, the formula used is:

$$\text{Rata-rata} = \frac{\text{Total Nilai}}{\text{Jumlah Siswa}}$$

$$= \frac{2876}{36} = 79,89$$

To describe the level of student mastery, the posttest scores are classified into five category evaluation, that is Very Good (86–100), Good (76–85), Fair (66–75), Poor (56–65), and Very Poor (<55).

This distribution shows that most students are at the mastery level. tall, with the majority enter category Very Good and Good, while only a small portion is in the low category.

Furthermore, analysis to be continued with count completeness Study based on the criteria, Completeness Minimum (KKM) as big as 75. Participant stated complete if you get a score ≥ 75. Of the total 36 participants, 26 participants met the KKM and were declared complete. Completeness calculation is carried out using the formula:

$$\text{Persentase Tuntas} = \frac{\text{Jumlah Siswa Tuntas}}{\text{Jumlah Siswa}} \times 100\%$$

$$= \frac{26}{36} \times 100\% = 72,2\%$$

$$\text{Persentase Belum Tuntas} = \frac{10}{36} \times 100\% = 27,8\%$$

Discussion

The findings of this study indicate that 72.22% of students achieved learning mastery, while 27.78% did not meet the minimum competency standard (KKM). This level of mastery demonstrates that the majority of students were able to reach the expected competence after participating in volleyball learning supported by Canva-based overhead serve learning media. The dominance of students in the Very Good and Good performance categories further confirms that the learning intervention contributed positively to students' technical skill acquisition. From a pedagogical perspective, mastery learning above 70% is commonly interpreted as evidence of effective instructional implementation in school-based physical education (Hastie et al., 2017; Metzler, 2017).

Conceptually, these results are consistent with motor learning theory, which emphasizes the importance of clear visual modelling, repetition, and structured feedback in the acquisition of complex movement skills such as the overhead serve (Schmidt, Lee, Winstein, Wulf, & Zelaznik, 2019). The overhead serve requires coordinated integration of perceptual, cognitive, and motor components, including body positioning, arm swing mechanics, ball toss accuracy, and timing (Forthomme et al., 2018). The use of animated video media allows learners to repeatedly observe correct movement patterns, thereby strengthening mental representation and facilitating skill automation (Wulf & Lewthwaite, 2016).

Empirically, the results align with previous studies showing that audio-visual and digital learning media significantly enhance students' understanding of sports techniques and improve learning outcomes in physical education (Ramli et al., 2018; Kartika et al., 2022; Andini et al., 2024). Visual-based instructional media have been shown to reduce cognitive load, clarify abstract movement sequences, and support students with diverse learning abilities (Mayer, 2020). In the context of volleyball learning, digital video media enable students to analyze movement phases that are often difficult to capture through verbal explanation alone (Evionora et al., 2018; Destriana et al., 2020).

The development process of the learning media followed the research and development (R&D) framework, which is widely recognized as an appropriate methodological approach for producing validated and practical educational products (Borg & Gall, 2003; Richey & Klein, 2014; Sugiyono, 2021). The systematic stages—ranging from needs analysis and product design to expert validation and limited trials—ensured that the media was pedagogically sound, technically accurate, and aligned with curriculum demands. Expert validation plays a critical role in R&D studies, as it ensures the accuracy of content, appropriateness of instructional design, and usability of media before classroom implementation (Branch, 2018; Plomp & Nieveen, 2013).

The Canva-based learning media developed in this study was packaged as a 15-minute animated instructional video (720p resolution), integrating volleyball history, basic rules, and detailed explanations of the overhead serve technique. The inclusion of contextual material alongside technical instruction supports holistic learning and aligns with contemporary physical education frameworks that emphasize cognitive, affective, and psychomotor domains simultaneously (UNESCO, 2015; Bailey et al., 2018). Moreover, the use of Canva facilitated the creation of visually appealing and structured content,

which has been shown to increase student engagement and motivation (Triningsih, 2021; Melinda & Saputra, 2021).

From a practical standpoint, the digital and flexible nature of the media represents a significant advantage. The ability to access learning materials anytime and anywhere through platforms such as YouTube supports independent learning and practice beyond formal class hours (Rahmatullah et al., 2020; Resmini et al., 2021). This accessibility is particularly relevant in post-pandemic educational contexts, where blended and technology-assisted learning have become integral components of school instruction (Akpinar, 2019; Mayer, 2020). Additionally, the media serves as a valuable reference for students during skill practice, enabling self-paced learning and repeated observation of correct techniques.

Nevertheless, the presence of students in the Poor and Very Poor categories indicates that media-based learning alone is not sufficient for all learners. These students require targeted mentoring, corrective feedback, and remedial programs to address individual motor learning difficulties (Metzler, 2017; Schmidt et al., 2019). This finding reinforces the notion that digital media should complement, rather than replace, the pedagogical role of the teacher. Effective physical education instruction requires the integration of media, direct guidance, task modification, and differentiated instruction to accommodate varying student abilities (Hastie et al., 2017; Bailey et al., 2018).

Overall, the findings suggest that Canva-based overhead serves learning media is effective, practical, and pedagogically relevant for supporting volleyball instruction in senior high schools. The results contribute empirical evidence to the growing body of literature on digital media integration in physical education and highlight the potential of visually driven learning tools to enhance technical skill development. At the same time, the study underscores the importance of follow-up instructional strategies to ensure inclusive learning outcomes for all students.

CONCLUSION

This study concludes that the Canva-based overhead serves learning media developed in the form of a 15-minute 10-second animated instructional video with a resolution of 720p and a file size of 33.4 MB is feasible, valid, and effective for use in volleyball learning at the senior high school level. From a conceptual perspective, the media aligns with principles of motor learning and multimedia learning, which emphasize the role of clear visual modelling, structured presentation, and repeated observation in facilitating the acquisition of complex sport skills. The systematic visualisation of movement stages supports students' cognitive understanding and psychomotor coordination in performing the overhead serve technique.

Empirically, the feasibility of the media was supported by expert validation results, including material experts (88.89%, sufficient category), media experts (73.3%, good category), and teacher validators (80%, good category), indicating that the content accuracy, instructional design, and visual quality met pedagogical standards.

Furthermore, the effectiveness test involving 36 Grade X students of SMA Plus Negeri 17 Palembang demonstrated a meaningful improvement in learning outcomes, as reflected by an increase in mean scores from 79.89 (pretest) to 90.77 (posttest), with an N-Gain value of 0.54 categorised as moderate.

These findings confirm that Canva-based learning media not only enhance learning outcomes but also increase student engagement and innovation in PJOK instruction. Therefore, this media can be recommended as an effective supplementary tool for volleyball learning, while future studies are encouraged to test its implementation on a broader scale and integrate it with differentiated instructional strategies.

ACKNOWLEDGMENT

The author would like to express his sincere and profound gratitude to all individuals and institutions that contributed to the successful completion of this research. Special appreciation is extended to the supervisors and examiners for their scholarly guidance, critical insights, and constructive feedback, which played a fundamental role in strengthening the conceptual framework, methodological rigour, and empirical analysis of this study. Their expertise and academic integrity were instrumental in ensuring that the research adhered to high scientific and ethical standards.

The author also gratefully acknowledges the support of the Physical Education (PJOK) teachers and the entire academic community of SMA Plus Negeri 17 Palembang, who provided permission, facilities, and a supportive learning environment for the implementation of this research. Their collaboration was essential in facilitating data collection, product trials, and the practical application of the Canva-based learning media within an authentic educational setting.

Furthermore, the author extends heartfelt thanks to all students who participated in this study for their enthusiasm, cooperation, and active engagement throughout the research process. Their involvement not only enriched the empirical findings but also ensured the relevance and applicability of the developed learning media.

Finally, the author hopes that the collective support and contributions received during this research will yield meaningful academic value and practical benefits, particularly in advancing innovation and quality in physical education learning.

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