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Audio Visual-Based Breaststroke Swimming Training Model for Beginner Athletes Elementary School (12-13 Years Old)

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Abstract

Breaststroke is one of the basic swimming styles most often learned by beginner athletes, but mastering the technique requires complex coordination between arm, leg and breathing movements. Innovation of audio-visual based training model is seen as a solution to increase the effectiveness of breaststroke technique learning. This study aims to develop and test the effectiveness of an audio-visual based breaststroke swimming training model for beginner athletes of elementary school (12–13 years old). This study uses a Research and Development (R&D) approach with the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The research subjects were 66 athletes divided into experimental and control groups. Data collection was carried out through observation, interviews, and swimming skills tests. Data analysis used descriptive statistics, normality tests, homogeneity tests, paired sample t-tests, and N-Gain tests with the help of IBM SPSS Statistics 25. The results showed that the developed training model was declared valid by material experts and media experts with several revisions for improvement. The implementation of the model showed a significant increase in the experimental group ($t = -10.566$; $p < 0.05$) compared to the control group ($t = -8.527$; $p < 0.05$). Improved learning outcomes in the experimental group demonstrated that integrating audio-visual media and ground training strengthened athletes' mental representations and motor coordination. The developed model not only improved performance but also enhanced the quality of the learning process in a more interactive and systematic way.

How to Cite

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INTRODUCTION

One of the most frequently learned and used swimming styles is the breaststroke. Breaststroke is a swimming style that requires good coordination between body movements, breathing, and timing (Febrianti et al., 2024) . Furthermore, according to Gonjo and Olstad (2021), speed is also an important element in breaststroke, especially in the context of competitive sports. As one of the most commonly learned styles by beginners, mastering the correct technique is crucial to avoid mistakes that can hinder the athlete's development (Surahman et al., 2023). Therefore, structured and repetitive practice is crucial in mastering new skills (Knapp, 2024; Septian et al., 2024). Mastery of these skills depends not only on repetition but also on how the information conveyed is understood by the athlete. Therefore, this process becomes increasingly crucial for beginners who need an effective approach to optimally master the basics of breaststroke.

Breaststroke is also a basic swimming style that is often the first choice for beginners because the technique is relatively easy to learn. However, mastering breaststroke technique requires consistent and targeted practice so that the movements are efficient and meet standards (Putri et al., 2024). One of the main problems in learning breaststroke is the difficulty for novice athletes in coordinating hand, leg, and breathing movements simultaneously (Septian et al., 2024). In addition, less than optimal physical conditions, such as lack of core muscle strength and body flexibility, are also obstacles. To date, most swimming training has been conducted in the water, so the limited time to provide technical understanding outside of practical training is a barrier (Wirth et al., 2022). Therefore, innovation in good and correct training methods is needed.

Breaststroke swimming methods or training can be carried out through land training and the use of audio-visual media. This method can help novice athletes overcome technical and physical obstacles before optimally training in the water. However, the expected innovation is the result of innovation that is needed and appropriate to field conditions. Land training has the advantage of improving the strength and flexibility of muscles that support breaststroke movements (Wardianti, 2023). Land training focuses on strengthening the core, legs, and shoulders, which are key components of swimming (Adegoju et al., 2021). Physical problems such as core weakness or lack of body flexibility often lead to inefficient swimming movements. Land training is designed to address these weaknesses by targeting specific areas that support movement in the water (Silva et al., 2022). When performed with audio-visual guidance, athletes can see precise demonstrations and imitate them correctly. This process provides a more interactive and enjoyable training experience compared to conventional methods (Araiza-Alba et al., 2021). Thus, audio-visual based land training is a potential innovation to improve breaststroke swimming skills in beginner athletes.

The use of audio-visual media in swimming training is relevant in today's digital era. This media allows athletes to visualize movements more clearly and understand correct technique in detail (Zulkifli et al., 2023). Another common problem is athletes' difficulty understanding verbal instructions given by coaches during in-water training, especially when movements require immediate correction. With audio-visual aids, athletes can see examples of correct movements and correct errors more quickly. In the context of breaststroke, the use of instructional videos can help athletes understand the coordination between hand, leg, and breathing movements without being distracted by the pressure of the water environment. Audio-visual also allows coaches to provide real-time feedback, so technical errors can be immediately corrected. Thus, the integration of this technology is expected to accelerate the learning process and improve the quality of breaststroke training.

Developing an audio-visual-based breaststroke training model for beginner athletes on land is an important effort to improve swimming skills and knowledge. In this context, the use of audio-visual media can have a significant impact on learning effectiveness, especially for athletes who are just starting out. Several researchers have studied the use of audio-visual media on swimming skills, such as Rahmadani et al. (2023)who conducted research using the ADDIE Research and Development (R&D) model method consisting of analysis, design, development, implementation, and evaluation. The breaststroke training model was developed based on an analysis of student needs, followed by a validation test by three validators, a practicality test by the coach, and an effectiveness test by five beginner athletes through a swimming skills test. The results of the validity test showed an average of 88.88% (very valid), practicality by the coach 93.33%, and beginner athletes 84.8% (very practical). The effectiveness test resulted in a percentage of 80%, categorized as very

effective. This model has been proven to be valid, practical, and effective in improving breaststroke swimming skills for beginners. Thus, this model can be applied in breaststroke swimming learning.

Prasetiyo and Wiyarno (2024) examined the influence of audiovisual media and demonstrations on the swimming abilities of Indonesian Navy cadets. Their study involved 100 students, divided into two groups: an experimental group and a control group. The results showed that the group treated with audiovisual media and demonstrations obtained a score of 73.16, higher than the group given demonstrations, which obtained a score of 66.39. This study indicates that audiovisual media and demonstrations can improve breaststroke swimming abilities in Indonesian Navy cadets.

Based on the research analysis, several main gaps were found: (1) The focus of previous research has been more on water training, while land-based innovations and audio-visual media have not been optimized; (2) Existing training techniques have not fully addressed the specific challenges of beginners, such as movement coordination; (3) The integration of audio-visual media with land training for a holistic approach has rarely been researched; (4) Previous training models, such as " Fun Swim " and ADDIE, have not effectively combined land training components and audio-visual media; (5) Solutions to increase motivation through more varied and interesting training methods have not been widely developed.

The researchers concluded that this study focused on developing an audiovisual media-based breaststroke training model on land for beginner athletes, a need that has not been optimally addressed. Therefore, this study aims to design and develop a training model that is not only effective but also engaging for beginner athletes, so they can better understand and master breaststroke techniques. This research is also expected to make a significant contribution to the learning and mastery of basic breaststroke techniques, especially for beginner athletes who require a more interactive, effective, and efficient approach than the traditional methods currently used.

METHOD

This research uses a Research and Development (R&D) approach by applying the ADDIE (Analysis, Design, Development, Implementation, Evaluation) framework. Operationally, the development procedure is carried out through five systematic stages:

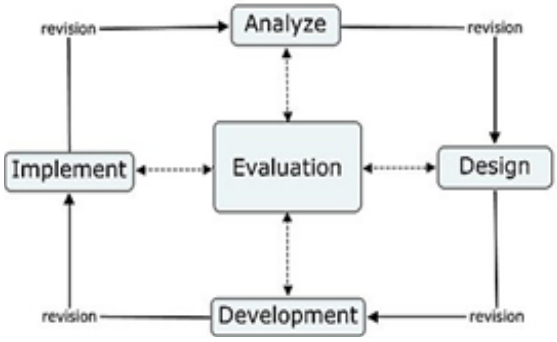

Figure 1. ADDIE Stages

In the initial stage, an analysis is conducted as a first step focused on needs assessment to identify key problems or needs in the field. In addition, a task analysis is also conducted to understand the relevant job components in developing the model (Cotter et al., 2023). The second stage of design is formulating objectives. Formulating training objectives that meet SMART criteria (Specific, Measurable, Achievable, Realistic, and Time-bound). Based on these objectives, valid evaluation instruments or testing tools are developed (Lestari & Sari, 2024). The third stage of development is the process of transforming the design into a concrete product. To ensure quality, initial testing (trials) is conducted as a form of formative evaluation to revise and refine the product based on field findings (Maydiantoro, 2021). The next stage is implementation. The developed product or model is then applied in real life to the target subjects. All tested elements are arranged in such a way to ensure the effectiveness of the system in a real context (Spatioti et al., 2022). The fifth stage of evaluation is conducted to measure the extent to which the model has successfully achieved its stated targets. This process includes formative evaluation (conducted simultaneously at each stage) and summative evaluation (a final assessment after the entire implementation process is complete) (Sial et al., 2024).

This study involved 66 elementary school athletes aged 12-13 who actively trained at three clubs located in East Jakarta. The study was conducted over 15 sessions. In addition, the study involved three practitioners and four experts two material experts and two audio-visual media experts to validate the model and content used in the study.

Data collection was conducted using several techniques, namely field observation, interviews, and tests, starting from July to November 2025. Thus, the research instruments used consisted of observation guidelines, interview guidelines, and questionnaires. The data obtained were

then analyzed using quantitative analysis techniques with the help of IBM SPSS Statistics 25.

RESULTS AND DISCUSSION

Initial analysis data was obtained through interviews with the following instruments:

Table 1. Interview Results

Question Items	Answer
Do you understand the basic techniques of breaststroke?	All athletes reported understanding the basic breaststroke techniques. They stated that this understanding was gained through gradual instruction and repeated practice, which gave them confidence. The coaches assessed the teaching approach as effective, as none of the respondents experienced any difficulties.
Does the exercise program tend to be boring?	The majority of athletes found the training program boring, generally due to the repetition of the same material without sufficient variation. Some athletes (a minority) still enjoyed the training because it included a combination of land and water. Coaches accepted this feedback and recognized the need for innovation and added variety (intensity, drill formats, games/small competitions) to increase athlete motivation and engagement.
Did practicing on land help you understand breaststroke technique better?	Most athletes experience the benefits of land training (such as strengthening the core, arms, and stability) that lead to more stable movements in the water. However, some athletes feel the connection between land and water isn't immediately apparent. Coaches consider land training effective for strength and body awareness but recommend adjusting drills to ensure a clearer transfer of movement to the pool.
Did watching the demonstration video help you understand breaststroke technique better?	The majority of athletes found demonstration videos helpful because they allowed them to see the details of the movements and replay them. A small number preferred hands-on practice. Coaches considered videos a powerful tool for visual comprehension, but emphasized that they must be combined with live correction to ensure athletes' technique is correct.

Based on the **Table 1** matrix above, it shows that (1) All athletes have understood the basic breaststroke techniques through gradual instructions, repeated practice, and effective coach guidance; (2) The majority of athletes consider the training program to be boring due to the repetition of the same material, although a small number still feel that the training is quite varied; (3) Training on land helps the majority of athletes improve core muscle strength, arms, and stability of movement in the water, although some feel that the benefits are not yet directly visible; (4) The use of demonstration videos greatly helps athletes' visual understanding, but still needs to be supplemented with direct practice and correction from the coach; (5) In general, understanding of the technique is good, but the variation of the training program and the integration of learning media with direct practice still needs to be improved so that learning outcomes are more optimal.

Design

The audio-visual-based breaststroke swimming training model for beginner athletes of elementary school (12–13 years old) is structured in stages and systematically, including breathing exercises, gliding, leg movements, hand movements, and coordination movements. Each training component is designed progressively, starting from mastering basic techniques such as breathing and streamlined positions to coordinating hand, leg, and breathing movements as a whole, with the support of audio-visual media to facilitate understanding and accuracy of movement. This training structure aims to help beginner athletes master breaststroke swimming techniques effectively, efficiently, and enjoyably according to their developmental stage. The following is the design of an audio-visual-based breaststroke swimming training model for beginner athletes of elementary school (12–13 years old) **https://www.youtube.com/watch?v=ePivL5-7IrI.**

Table 2. Training Model

Model	Objective
Inhale (mouth) and exhale (nose).	To train breath control in swimming sports
Breathing exercises while lying on your stomach.	To practice breathing control movements in and out of the water.
Streamline standing position	To train streamlined hand movements that are straight and tight when done and the position of the arms behind the ears can be clearly seen.
Streamline on the wall	To train the whole body, you can do streamline movements straight.
Streamline squat and jump	To train the movement and coordination between the feet and hands so that they can be well synchronized.
Squat, jump and streamline with flying	To train movements, responses and coordination to be well synchronized.
Streamline with core activation	To increase stability for efficient movement while swimming

Frog legs and pointing	To practice the correct frog leg movements, the pointing movement of the breaststroke swimming legs has a big influence on the swimming speed.
Frog kick in a sitting position	To practice a series of breaststroke swimming kick movements that can be seen visually by the eye.
Frog kick in prone position	To practice a series of breaststroke leg movements so that athletes can more easily understand before entering the pool.
Standing frog kick	To make it easier for athletes to understand the material on breaststroke leg movements one by one.
Peguin Street	To train the ankles to bend when pointing the legs in breaststroke swimming.
Pulling hand movement	To train hand movements so that they don't fall and the elbows don't fall backwards.
Pulling and head movements	To train coordination and synchronization movements between the hands and head.
Pull and push hand movements	To practice hand movements with easier steps and be able to do good and correct breaststroke hand movements.
Complete breaststroke swimming arm movements	To practice the breaststroke hand movement series more easily and visually visible to the eye.
Hand, head and mouth movements	To train coordination and synchronization movements between hands, breath and head.
Recovery movement by pushing the pullbuoy	For coordination and synchronization between the hands and head when the hands have to return to the front or recovery
Hand and breath coordination	To train good and correct coordination and synchronization between breath control and hand movements.
Move your feet 2x and your hands 1x	To train hand, foot, head and breathing movements with certain drill exercises
Hand-foot coordination 2-1,1-1	To train hand and foot movement coordination with varying rhythmic patterns, improve synchronization of hand pulls, kicks and breathing, and accustom athletes to maintaining a streamlined body position and balance during movement transitions.
Move your hands once and your feet once. (pause 5 seconds)	To improve motor control and technical awareness (motor control), train the timing accuracy between hand pulls and leg kicks, and help athletes understand the correct sequence of movements through sufficiently long pauses.
Hands 1x and feet 1x (pause 2 seconds)	To refine the coordination of hands, feet, and breathing with a more dynamic tempo, improve the smoothness of transitions between movements, and prepare athletes for a more continuous and efficient breaststroke swimming movement.

Development

After the data collection stage and preparation of the initial design of the audio-visual-based breaststroke swimming training model for beginner athletes of elementary school (12-13 Years Old old) were completed, the researcher proceeded to the validation test stage to ensure the feasibility of the model that had been developed. This validation test was carried out by involving two lecturers who were material experts, three lecturers who were audio-visual media experts and three practitioners. The 21 models that had been designed were declared feasible and valid with notes on improvements that must be followed up by the researcher. The suggestions and improvements from the validator are as follows **Table 3. Table 4.**

Table 3. Validation Notes by Subject Matter Experts and Practitioners

Validator	Notes
Subject Matter Expert 1	For the design of the Exercise model, change the naming from "Hand" to "Arm" and "Leg" to "Leg" then the video sequence can be done from easier to more difficult movements to make the Exercise process easier.
Subject Matter Expert 2	There needs to be a practice mode chart at the beginning of the video, to make it easier for viewers to understand the flow of thinking.
Practitioner 1	In the hand and foot exercise section, to be more precise it can be changed to arm movements and leg movements.
Practitioner 2	Each video model of Jump and streamline exercises, when in the air the legs are brought together to get a good and maximum streamline and provides an explanation and purpose of each exercise model.
Practitioner 3	The starting position of the foot from the frog leg pull to the chest leg kick can be confusing/difficult to understand for athletes.

Table 4. Validation Notes by Media Experts and Practitioners

Validator	Notes
Media Experts 1, 2 and 3	The background sound and transitions have a spirited, soft and swimming-themed feel with the beat adjusted so that the audience is motivated to do the movements and the names are easier to remember.
Media Expert 1	Every video shot that is looped/jump cut must be made smoother so that it looks more comfortable to the audience.
Media Expert 3	For every movement that is similar/difficult to understand/detailed, provide stop and go in the video and display a short text to help the audience easily understand the message you want to convey.

Media Expert 3	Instructional dubbing sound must be adjusted to the video that appears, according to the dubbing that is heard
Practitioners 1, 2 and 3	Images, text, tempo, video speed and sound must be clear so that the intent and purpose of each video can be easily understood by athletes.

Various input from experts indicated the need for improvements to the content of the audiovisual-based breaststroke training model. The validators emphasized the importance of using more precise terms, such as replacing "hand" with "arm" and "leg" with "leg." They also assessed that the video sequence should proceed from the simplest movements to the more complex ones. They also suggested including a flowchart at the beginning of the video to help viewers understand the overall structure of the training. All of these observations demonstrate that the validity of the material's content is highly dependent on accurate terminology and clarity of presentation.

The assessment of the audiovisual media also revealed the need to improve the quality of the presentation and information delivery. Media experts recommended the use of relevant background music and smoother video transitions to ensure audience comfort and motivation. They also requested the addition of assistive elements such as stop-and-go and short captions to clarify difficult-to-understand movement sections. These inputs demonstrate that the technical quality of the media plays a crucial role in the success of the developed training model.

Implementation

The implementation stage was carried out after the audio-visual-based breaststroke swimming training model for beginner athletes of elementary school (12-13 Years Old) was declared feasible and had been revised according to the notes provided by experts and practitioners. A total of 21 models were tested using a quasi-experimental method, which compared two groups consisting of an experimental group of 33 samples and a control group of 33 samples. At this stage, the experimental group was the group that received the audio-visual-based breaststroke swimming training model treatment. Meanwhile, the control group was the group that received treatment with the conventional training model.

The implementation results are presented in descriptive statistics and t-tests. The t-test was conducted after the data in this study had passed normality and homogeneity tests. The results of the test using IBM SPSS Statistics 25 software are as follows **Table 5.**

Table 5. Descriptive Statistics Results

	N	Catfish	Mean	Std. Dev
Pretest Experiment	33	469	14.21	5.337
Postest Experiment	33	561	5:00 p.m.	5,900
Pretest Control	33	474	14.36	5.273
Postest Control	33	526	15.94	5.080

The data **Table 5** show that both the experimental and control groups experienced an increase in scores from pretest to posttest, but the increase in the experimental group was much greater. In the experimental group, the average score increased from 14.21 to 17.00 with a slight increase in the standard deviation from 5.337 to 5.900, indicating an increase in the variation of participants' abilities after the treatment was given. Meanwhile, the control group experienced an average increase from 14.36 to 15.94 with a relatively stable standard deviation, namely from 5.273 to 5.080. The difference in the magnitude of the increase between the two groups indicates that the treatment given to the experimental group was more effective in improving the abilities of participants than the control group. Overall, these data suggest that the training model or intervention given had a more significant positive effect on the experimental group.

In the next stage, the researcher conducted normality and homogeneity tests as prerequisite tests before conducting the t - test , and the results of the analysis showed that all data met both requirements. Based on the Kolmogorov - Smirnov normality test, each group both pretest and posttest in the experimental and control groups has a significance value above 0.05, so all data are declared normally distributed. The Sig. value of the experimental pretest is 0.062, the experimental posttest is 0.076, the control pretest is 0.153, and the control posttest is 0.078, all of which meet the normality criteria. Furthermore, the homogeneity test using Levene's Statistic produces a Sig. value of 0.677 which is greater than 0.05, so the data are declared homogeneous. By fulfilling the assumptions of normality and homogeneity, the data are suitable for further analysis using the parametric t - test to test the effectiveness of the treatment in this study. The results of the t-test through the paired sample t-test produce the following data **Table 6.**

Table 6. T-Test Results

		t	df	Sig. (2-tailed)
Pair 1	Experiment Pretest - Experiment Posttest	-10,566	32	.000
Pair 2	Control Pretest - Control Posttest	-8,527	32	.000

The results of the paired sample t-test on both data pairs show that the t-value and Sig. (2-tailed) both indicate a significant difference between the pretest and posttest scores. In Pair 1 (Pretest – Posttest Experimental Group), the t-value = -10.566 and the Sig. value = 0.000, so the difference is declared very significant. Meanwhile, in Pair 2 (Pretest – Posttest Control Group), the t-value = -8.527 and the Sig. value = 0.000, which also shows a significant difference between the pretest and posttest in the control group. Because the Sig. value in both groups is smaller than 0.05, it can be concluded that both the experimental and control groups experienced a significant increase from the pretest to the posttest based on the t-value and its significance value. Therefore, both groups showed a difference, the next step was to test the data using the N-Gain Score to determine the increase between the pretest and posttest of the experimental and control groups. The results of the N-Gain Score in this study are as follows **Table 7**.

Table 7. N -Gain Score Test Results

	N	Mean
N_Gain_Score_Experiment	33	.3903
N_Gain_Score_Kontrol	33	.1864

Based on the results of the **Table 7.** N-Gain Score test between the pretest and posttest, the experimental group obtained a value of 0.39, indicating that the increase in the experimental group's pretest and posttest results was in the moderate category. Meanwhile, the results of the N-Gain Score test between the pretest and posttest of the control group obtained a value of 0.18, indicating that the increase in the control group's pretest and posttest results was in the low category. Thus, the audio-visual-based breaststroke swimming training model is more effective than the conventional training model for improving breaststroke swimming in beginner athletes of elementary school (12-13 Years Old).

Evaluation

The evaluation phase was conducted after the audio-visual-based breaststroke training model for beginner athletes in elementary school (12-13 Years Old) was implemented. This evaluation included two main aspects: implementation testing by practitioners and effectiveness testing based on implementation results in the field. Based on the evaluation results, it was concluded that all items in the implemented training model could be carried out according to the design. The implementation process also went well and was in accordance with the development objectives, indicating that this model is suitable for use in improving children's passing skills effectively and enjoyably.

The greater improvement in breaststroke swimming ability in the experimental group indicates that the use of an audio-visual training model provides a more effective learning impact than conventional training. This finding confirms that novice athletes learn not only through repetition of movements, but also through strengthening mental representations built from visual and verbal information simultaneously. This condition is in line with the Cognitive Theory of Multimedia Learning proposed by Sumual et al. (2025), which states that learning will be more optimal when information is presented through more than one cognitive channel. At the age of 12–13 years, athletes are in the transition phase towards formal operational thinking skills, so concrete visual support is very helpful in understanding complex swimming techniques. Therefore, the increase in posttest scores and the moderate N-Gain category in the experimental group reflects the effectiveness of audio-visual media in accelerating the motor learning process.

A training structure that is structured in stages from simple to more complex movements has also been shown to play a significant role in improving athlete learning outcomes (Sari & Widodo, 2025). The variety of exercises applied can reduce boredom and increase athlete motivation and engagement during the training process. This finding is in line with the Schema Theory of Motor Learning proposed by Myer et al. (2011), which emphasizes the importance of training variations in building flexible and adaptive movement schemes. Furthermore, the regulation of tempo, pauses, and hand-foot coordination patterns helps athletes develop motor control and accurate timing. Thus, the developed training model not only improves performance but also improves the quality of the motor skill learning process.

The effectiveness of the audiovisual-based training model is also reflected in its ability to facilitate the transfer of land-based training to

water training. Although some athletes did not immediately experience the benefits of land training, implementation results showed that the integration of physical strengthening and visual demonstrations can improve stability and movement efficiency during swimming. This finding supports the Transfer of Training theory proposed by Magill and Anderson (2017), which states that positive transfer will occur when there are similarities in movement structure and cognitive understanding between training and performance. Furthermore, the use of video demonstrations strengthens the observational learning process as described by Lee and Hemphill (2026), where individuals learn through observing correct models. Therefore, this training model is not only technically effective but also aligned with the principles of motor learning and modern sports pedagogy.

During the implementation of this audio-visual breaststroke training model development study, several findings were discovered that did not fully align with initial expectations. For example, some athletes in the experimental group tended to stagnate in their progress, and distractions emerged in the initial phase because athletes focused more on the media display than on movement execution. This suggests that not all learning styles respond to visual approaches and still require direct coaching from coaches. Furthermore, this study also has methodological weaknesses, including other assessment instruments that are still general and do not measure biomechanical aspects in depth; the lack of an effect size analysis to strengthen the practical significance of the statistical results; and the potential for treatment bias due to the proximity of the training environment between the experimental and control groups. Furthermore, the study, which only involved 66 athletes aged 12–13 from three clubs in East Jakarta, and the duration of the treatment, which was 15 sessions, limits generalizability and does not comprehensively describe long-term impacts. Therefore, although the developed model proved effective in improving technical skills, interpretation of the results still needs to be carried out proportionally, taking into account the various limitations, constraints, and field dynamics that occurred during the study.

CONCLUSION

Based on the results of the research and development that has been conducted, it can be concluded that the audio-visual-based breaststroke swimming training model for beginner athletes elementary school (12–13 years old) is proven to be valid, feasible, and effective in improving breaststroke swimming technique skills. The model developed through the ADDIE approach successfully integrates land training and audio-visual media systematically and progressively. The results of the implementation test showed a significant increase in the experimental group compared to the control group, with an N-Gain value in the medium category (0.39), while the control group was only in the low category (0.18). This confirms that the use of audio-visual media combined with structured training can accelerate technical understanding, improve motor coordination, and improve the quality of motor learning in beginner athletes. Thus, this training model can be recommended as an innovative alternative in breaststroke swimming training for athletes aged 12–13 years.

REFERENCES

Adegoju, F. A., Abon, J. K., & Olatomirin, F. (2021). Effect of Dry Land Strength Training on Front-Crawl Swimming Performance Among Undergraduate Trainees of Lead City University, Ibadan, Nigeria. International Journal of Interdisciplinary Research Methods, 8(1), 1-22.

Araiza-Alba, P., Keane, T., Matthews, B., Simpson, K., Strugnell, G., Chen, W. S., & Kaufman, J. (2021). The potential of 360-degree virtual reality videos to teach water-safety skills to children. Computers & Education, 163, 104096.

Cotter, S., Yamamoto, J., & Stevenson, C. (2023). A systematic characterization of food safety training interventions using the analyze, design, develop, implement, evaluate (ADDIE) instructional design framework. Food Control, 145, 109415.

Febrianti, A. T., Indah, E. P., & Rachman, A. (2024). Analisis Teknik Renang Gaya Dada Pada Atlet Pemula Tibra Banua Aquatik Club Kabupaten Banjar. Jurnal Educatio FKIP UNMA, 10(2), 560-567.

Gonjo, T., & Olstad, B. H. (2021). Race analysis in competitive swimming: A narrative review. International Journal of Environmental Research and Public Health, 18(1), 69.

Knapp, B. (2024). Skill in sport: the attainment of proficiency. Taylor & Francis.

Lee, Y., & Hemphill, M. A. (2026). Implementing Mediational Observational Learning Techniques for Social Emotional Learning in Specific Physical Education Content. Journal of Teaching in Physical Education, 1(aop), 1-9.

Lestari, K. I. D., & Sari, N. M. D. S. (2024). Optimizing Feedback for Elementary Students through Structured SMART-Based Assessment Tools. Journal of Education Technology, 8(3).

Magill, R., & Anderson, D. I. (2017). Motor learning and control. McGraw-Hill Publishing New

York.

Maydiantoro, A. (2021). Research model development: Brief literature review. Jurnal Pengembangan Profesi Pendidik Indonesia, 1(2), 29-35.

Myer, G. D., Faigenbaum, A. D., Chu, D. A., Falkel, J., Ford, K. R., Best, T. M., & Hewett, T. E. (2011). Integrative training for children and adolescents: techniques and practices for reducing sports-related injuries and enhancing athletic performance. The Physician and sportsmedicine, 39(1), 74-84.

Prasetiyo, A. T., & Wiyarno, Y. (2024). The Effect of Audiovisual and Demonstration Towards Students Swimming Ability of Navy's Cadets. Journal of Education and Teaching (JET), 5(3), 291-300.

Putri, A. S., Miftakhudin, H., & Wattimena, F. Y. (2024). Perbandingan Latihan Two Kick One Pull dengan Controlled Breaststroke terhadap Stroke Rate Gaya Dada. Mutiara: Jurnal Penelitian dan Karya Ilmiah, 2(5), 134-148.

Rahmadani, E., Burhan, M. A., & Ricky, Z. (2023). Pengembangan Model Latihan Renang Gaya Dada Untuk Pemula di Club HBSC Dharmasraya. Innovative: Journal Of Social Science Research, 3(4), 3250-3261.

Sari, D. A., & Widodo, A. (2025). Program Gymnastics Pada Anak Usia Dini: Sebuah Tinjauan Literatur. Jambura Health and Sport Journal, 7(2), 117-127.

Septian, R. D., Hendrayana, Y., Ugelta, S., Nugraha, R., Riansyah, R., & Al Ghazaly, M. D. A. (2024). Pengaruh Pendekatan Pembelajaran (Problem Based Learning dan Discovery Based Learning) dan Motor Educability Siswa Terhadap Penguasaan Keterampilan Dasar Renang Gaya Bebas Dan Gaya Dada. Gelanggang Olahraga: Jurnal Pendidikan Jasmani dan Olahraga (JPJO), 8(1), 74-86.

Sial, Z. A., Fatima, Z., & Fatima, S. Z. (2024). Addie Model of Instructional Effectiveness?: Analyzing The Impact On Students Learning. vol, 6, 64-72.

Silva, C., Jesus, J., Vilarigues, I., Aranha, I., Candeias, I., Santos, F., Figueiredo, T., & Espada, M. (2022). Efecto de un programa de entrenamiento de fuerza y acondicionamiento en seco sobre las habilidades físicas en practicantes federados en natación. Cuadernos de Psicología del Deporte, 22(1), 230-244.

Spatioti, A. G., Kazanidis, I., & Pange, J. (2022). A comparative study of the ADDIE instructional design model in distance education. Information, 13(9), 402.

Sumual, S. D. M., Liow, S. S. Y., & Jhony, K. (2025). Implementasi Pembelajaran Berbasis TIK dalam Pendidikan: Studi Literatur tentang Manfaat, Hambatan, dan Strategi Pengembangan. Edutik: Jurnal Pendidikan Teknologi Informasi dan Komunikasi, 5(6), 2504-2512.

Surahman, F., Yeni, H. O., & Sanusi, R. (2023, 2023). Analysis of Breaststroke Technique in Physical Education, Health, and Recreation Students at Karimun University.

Wardianti, E. (2023). Pengembangan Model Latihan Pembalikan EW'S Untuk Meningkatkan Prestasi Renang Gaya Ganti Perorangan di Perkumpulan Renang Kota Bengkulu [Magister Thesis, Universitas Negeri Yogyakarta]. Yogyakarta.

Wirth, K., Keiner, M., Fuhrmann, S., Nimmerichter, A., & Haff, G. G. (2022). Strength training in swimming. International Journal of Environmental Research and Public Health, 19(9), 5369.

Zulkifli, Z., Henjilito, R., Yani, A., Alficandra, A., Makorohim, M. F., Yudho, P. K., & Zhuo, P. Y. (2023). Development of Swimming Learning Models Through Adobe Flash Application Media in High Schools. JOSSAE (Journal of Sport Science and Education), 8(2).