

## Development of Physical Training Models for U 15 Athletes in Archery

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### ABSTRACT

**Background:** This study aims to produce Physical Training Models of athletes in 15 Archery Sports, as a reference used for athletes and coaches in conducting training. In the development of Physical Training Models for athletes u 15 Archery Sport, it provides an overview of the rubber band gym training model, body weight in order to provide a variety of physical exercises for archery athletes un 15. **Methods:** This research is research and development. The method in this study uses the research and development (R&D) method. **Results:** This research was carried out by research methods, namely: identification of potentials and problems, information collection, product design, design validation, product manufacturing, expert validation, product revision, trial, final product. **Conclusion:** The results of the study show that the validation results from Media Experts are 77.1%, and from the validation results of Subject Matter Experts are 87.2%. Based on small group trials, the percentage of effective and suitable for use was obtained at 77.9%, and large-scale trials were effective and feasible to use at 85.1%, with suggestions and inputs such as adding or supplementing norms to tests and measurements as well as replacing book cover images. This media is declared suitable for use as a training medium and a reference guide for archers.

**Keywords :** physical training; exercise; athlete; archery

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- A) Conception and design of the study;
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## INTRODUCTION

Exercise is one of a person's physical and psychological activities that is useful for maintaining and improving the quality of one's health after exercise. Sports activities can be carried out anywhere at any time and are carried out by anyone, whether individuals or groups, ranging from children, adolescents, adults or the elderly (Ishak, 2022). Physical fitness is also the compatibility of physical condition with the task that must be carried out by the physical (Raharjo, 2014), or in other words to be able to carry out certain physical tasks according to the nature of the physical task Or it can be said to improve physical appearance with various goals for example to be able to work full-time without meaningful fatigue and still be able to do additional activities that are emergency (Mada, 2023). It needs to be understood by players, coaches and parents of players in order to be able to optimize the development of player achievements and achieve a healthy and fit degree (Mukarromah et al., 2017). Another goal is to improve muscle, heart, blood vessel,

and respiratory strength, and also to improve post-injury physical strength (Penjakora et al., 2021).

Sport can also be used as a unifying tool. In addition, exercise can also make a person's body physically and spiritually healthy which will eventually form a quality human being (Dwi et al., n.d.). Another opinion (Agustin et al., 2018) explains that sport can be seen as a series of activities, movement skills or playing objects, which are structured and systematic using a certain set of rules in their implementation. Sport cannot be separated from human life, because human life consists of two aspects, namely physical and spiritual aspects that cannot be separated (Utomo, 2018) Sport also has an important role in health and provides various benefits for life, and exercise is also one of the important physical needs for humans (Raharjo, 2014). Sport is a form of human movement behavior that is carried out specifically for the sport, which has various directions and goals so that sport is a phenomenon that is relevant to social life for each person (Taufik & Mus'id, 2020). Sports are also believed to be able to build positive values such as: creative, disciplined, responsible, proactive, critical, sportsmanlike, competitive for humans and shaping the character of the nation (Dwi Oktafiranda et al., 2021). Sport is also a forum for developing physical growth to complete children's growth and development tasks (Pamungkas, 2019). School is a means for children to learn to move with physical education subjects. Therefore, the role of sports for children is very important, of course, good and balanced coaching is needed (Quality et al., 2024).

Exercise in general is a person's physical and physical activity that is beneficial in maintaining and improving the quality of health. Exercising is a person's need in daily life to create a healthy and fit body (Hidayat & Munandar, 2023). Sport has an ever-changing function due to objective and subjective variables as well as differences in morality and culture around the world. However, the nature of sport itself remains the same, with the goals of sport including profession, work, recreation, health, achievement, effort, unity, and means to struggle (Bernhardin, 2022). The development of the times and technological advances today have found many sports equipment that are able to support the sport and even become a benchmark for coaches in applying training to the sports they are handling (Ishak, 2022).

Furthermore, the National Sports System Law No. 3 of 2005 states that: "The development and development of national sports that can ensure equal access to sports, improved health and fitness, improved achievements, and sports management that is able to face the challenges and demands of changes in national and global life requires a national sports system (Rahma et al., 2024). The current advances in science and technology are advancing so rapidly that it is undeniable that innovations in archery are also developing in various studies (Henjilito & Zikri, 2022) The advancement of science and technology also plays a role in various physical training activities and technology used during archery competitions, Science and technology support also helps athletes to achieve achievements ranging from talent search, training to competitions as well as athletes and coaches (Raharja et al., 2021).

At this time, the sport of Archery is very developed (Ks, 2013) but there are still coaches who do not understand the variations of the training model to train the physique of beginner athletes or junior athletes, Reviewed from biomechanics, namely releasing an object towards maximum accuracy and reviewed from the side of movement learning or motor learning archery means closed movement skills, Archery is also a branch of static sports by involving good quality physical components namely the endurance, strength and flexibility of the upper muscles. The implementation of archery basics in the process of pulling the bowstring, there is isotonic contraction in the muscles at the stage when the initial pull (predraw) of the muscles. In the full draw stage, the fingers of the hand pull the bowstring until it sticks to the bottom of the chin (anchoring) and the bow is held in the arm with a locked position so that the part of the arm that grabs the bow occurs isometric contraction (Haryanto et al., 2021). In improving athletes'

achievements, physical preparation is one of the most important factors in training to achieve a high achievement (Yunida et al., 2017). Many archery clubs in each region do not have the tools for personal physical training or the club. So they sometimes have to use makeshift equipment to do physical exercises and sometimes some clubs also rent a gym for athletes to do physical exercises, so the time is very limited.

Achievement archery is a sport that fosters and develops sportsmen in a planned manner. The results of a high achievement are low, one of the factors is a mirror of the quality of skills, science and technology and sport science of a coach (Jufrizal et al., 2018). Archery is a sport of fine and rough motor skills, where success is determined by the capacity to conduct talent scouting from an early age. However, most people know/learn archery as teenagers (Cendra & Sasmariato, 2023). In line with the growth and development of archery sports, to achieve achievements must always be tried as much as possible. Achieving maximum archery achievements is not easy. To achieve high achievements, it must be prepared from an early age, work hard and be supported by factors that can affect the achievement of achievements (Dewi & Palgunadi, 2021).

The most important requirement in archery is consistency. Every movement or form of archery technique, body posture, how to pull, aim, to release arrows and follow through must be done the same every time shooting and it can only be achieved by practicing the same movements every day and practicing focus, patience, and calmness (Saparuddin, 2019).

Some of the problems of athletes in shooting such as: When releasing arrows, many of the athletes are not strong when pulling the bow and lack of concentration on the aiming. Such a condition is caused because athletes do not have the strength to draw the bow so that the accuracy of the arrow is still very far from perfect. Based on the description of the background of the problem above, the researcher is interested in conducting a research with the title "Development of a Physical Training Model for Junior U15 Athletes in Archery Sports".

## METHOD

This research model is Research and Development (R&D). This research aims to produce a new product, namely a reference book for the development of Physical Training Models for athletes in 15 Archery Sports. This development research model uses (Research and Development) Analysis, Design, Development, Implementation, Evaluation (ADDIE) (Maksum, 2012). The conclusion of the various statements contained above is that research and development (R&D) is a research method used to develop or produce and validate an educational product, which is then tested for effectiveness and feasibility. The method in this development consists of 10 stages, namely: (1) potential and problem, (2) data collection, (3) product design, (4) design validation, (5) usage trial, (6) product revision, (7) product trial, (8) design revision, (9) product revision, and (10) mass production.

## Instruments

The data used in this study is in the form of qualitative data and quantitative data. The type of quantitative data comes from the results of interviews with Archery athletes, input data from material experts and media experts on the products developed. Quantitative data was obtained from the results of research on products. During the preliminary study, the data collection technique used was a questionnaire. For product development data collection techniques, expert validation is used the Delphi technique. Trial data collection techniques in the field (small scale and large scale) use questionnaires and observations.

## Data analysis techniques

The data analysis techniques used in this study are quantitative descriptive analysis and qualitative descriptive analysis. Quantitative descriptive analysis was carried out to analyze the following data: (1) value scale data on the assessment of the draft, (2) data from small-scale trial observations, (3) large-scale observation data. Meanwhile, qualitative descriptive analysis was carried out on: (1) data from interviews during the preliminary study, (2) data on deficiencies and inputs on products before and after the trial in the field.

## RESULTS

### Findings

The development of Physical Training Models for athletes in 15 Archery Sports has been completed and validated by Media Experts and Material Experts. The preparation of the development of this book has gone through several stages of development research. The preparation of the development of Physical Training Models for athletes in 15 Archery Sports with product planning begins with looking for relevant results as a reference for researchers and looking for references for related books, then making an initial draft which then gets advice and input from Material Experts and Media Experts on the initial product. In the evaluation of the initial draft, there were several suggestions from Media Experts and material experts, namely: 1) Changing the cover design. 2) Adding the biography and photo of the author. 3) Image editing. 4) Provide additional forms of exercise that are more varied so as not to cause saturation for athletes. 5) added tests and measurements to CHAPTER V. 6) added footer and header. 7) Sort the muscle parts from the upper extremities to the bottom.

The results of input or suggestions from Media Experts and Subject Matter Experts will be used to refine the initial product before being tested on a small scale. The development process of this book goes through research and development procedures, some planning, production and evaluation. The product was developed using Adobe Acrobat XI Pro and corel draw x5. When the initial draft has been validated by Media Experts and Material Experts, the initial product draft is prepared. After that, the initial product of the Physical Training Models of athletes u 15 Archery Sports will be validated by Media Experts and Material Experts. The results of validation by experts were declared feasible with minor revisions and continued for small group trials. In the validation of experts with stages I and II. The small group trial was carried out on January 22-27, 2025 Archery Club Riki Archery Shool athletes totaled 12 athletes. In small-scale trials with a total effective and feasible percentage of results of 77.9% with the category of "Excellent" with input or suggestions and declared feasible to continue large-scale trials. The input and suggestions on small-scale trials are used to improve the products produced. After knowing the results of the small group trial that the Physical Training Model Book for athletes u 15 Archery Sports was declared in the category "Excellent" then continued with a large group trial on February 14-21, 2025 at the archery kub of the Hillal archery club totaling 22 athletes. In a large group trial with a total effective and usable percentage result of 85.1% with the category "Excellent". The quality of the book Physical Training Models of athletes u 15 Sport Archery is included in the criteria of "Effective and feasible". This statement can be proven from the results of the analysis of the "Effective and Feasible" assessment from both experts, both Media Experts and Material Experts, during small group trials, and in large group trial assessments the "Effective and Feasible" category and books can be used as a guide for training. In the Physical Training Models of athletes u 15 Archery Sports there are advantages and disadvantages. The advantages of this product are: 1) Attractive appearance design. 2) Easy to carry around, 3) Makes it easier for coaches and athletes to carry out training programs, 4) As an additional source of reference for coaches. The disadvantages of this product are: 1) The information on the image is



very small due to the size made, 2) The image is not bright and the size is not large due to the size of the book made.

The author's limitations in carrying out this research are constrained by time and cost. As for some of these weaknesses, please pay attention and further development efforts can be made to obtain better product results. This reality will further open up opportunities for further improvements

## CONCLUSION

Based on the results of research and development of the Basic Model of Physical Training for the Archery Branch, it can be concluded that: 1) Product manufacturing begins with the preliminary study stage through observation, interviews with trainers, looking for books as references, looking for relevant results as a reference for trainers, making 2D training model drawings to be integrated into the product to be developed. Product design begins with discussions with experts in their fields to get a design that suits the material, take pictures according to the approved material, image editing, and create products using Adobe Acrobat XI Pro and corel draw x5; 2) The specification of the size of the product produced is 14 cm x 20 cm with a red base color. The material used in the cover uses 230 gr ivory paper accompanied by a layer of glossy lamination and the contents of the book use 80 gr HVS paper.

The feasibility level of the Basic Model – Basic Physical Training of the Archery Sports Branch based on Media Experts is as large as the results of the study show that the validation results from Media Experts are 77.1%, and from the validation results of Material Experts are 87.2%. Based on small group trials, the percentage of effective and suitable for use was obtained at 77.9%, and large-scale trials were effective and suitable for use at 85.1%, Overall the media model model of the basics of physical training in archery sports is suitable for use after one stage of testing. This development research can be used to add references for coaches in learning more deeply about biomotor, flexibility, heart endurance, muscle endurance, in athletes.

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## CONFLICT OF INTEREST

There are no conflicts of interest in this article.

## REFERENCES

- Agustin, Y., Indra, E. N., & Afriani, Y. (2018). Asupan protein dan somatotype pada atlet pencak silat di Pembinaan Atlet Berbakat Yogyakarta. *Ilmu Gizi Indonesia*, 1(2), 120. <https://doi.org/10.35842/ilgi.v1i2.37>
- Bernhardin, D. (2022). Weight Training Pada Otot Lengan di Olahraga Panahan. *Jurnal Master Penjas & Olahraga*, 3(1), 168–177. <https://doi.org/10.37742/jmpo.v3i1.50>
- Cendra, R., & Sasmariato. (2023). Sosialisasi Olahraga Panahan Untuk Pemuda Karang Taruna Kampung Berumbung Baru Kec. Dayun Kab. Siak. *Community Education Engagement Journal*, 4(2), 34–39. <https://doi.org/10.25299/ceej.v4i2.11441>

- Dewi, P. C. P., & Palgunadi, I. K. A. (2021). Pengaruh Latihan Core Stability terhadap Keseimbangan Atlet Panahan Usia 7-11 Tahun. *Jendela Olahraga*, 6(2), 59–67. <https://doi.org/10.26877/jo.v6i2.7529>
- Dwi, A., Rahmat, N., Keolahragaan, S. I., Kesehatan, P., Olahraga, F. I., Keolahragaan, S. I., Kesehatan, P., & Olahraga, F. I. (n.d.). KONTRIBUSI TINGKAT KONSENTRASI TERHADAP KETEPATAN HASIL PANAHAH RONDE NASIONAL JARAK 40 METER (STUDI PADA ATLET PUTRA UNIT KEGIATAN MAHASISWA PANAHAH UNIVERSITAS NEGERI SURABAYA ). 383–390.
- Dwi Oktafiranda, N., Fakultas, Y., & Kegiatan, A. (2021). Pengenalan dan Pemahaman Cabang Olahraga Panahan pada Anggota Karang Taruna Japos, Tangerang Selatan. *Prosiding Seminar Nasional Pengabdian Kepada Masyarakat*, 2021, 36–41. <http://journal.unj.ac.id/unj/index.php/snppm>
- Haryanto, A. I., Gani, A. A., Ramadan, G., Samin, G., Fataha, I., & Kadir, S. S. (2021). Shooting Athlete Mental Training. *JUARA : Jurnal Olahraga*, 6(1). <https://doi.org/https://doi.org/10.33222/juara.v6i1.1188>
- Henjilito, R., & Zikri, I. (2022). *Construction of the Long Jump Test for Physical Education , Health and Recreation Students*. 52–57.
- Hidayat, T., & Munandar, R. A. (2023). Analisis Kebugaran Jasmani Atlet Panahan Kab. Dompu pada Porprov NTB Tahun 2023. *Jurnal Pendidikan Jasmani, Kesehatan, Dan Rekreasi*, 1(1), 1–7. <https://doi.org/10.59584/jurnalpjkr.v1i1.15>
- Ishak, M. (2022). Metode modifikasi alat busur dalam meningkatkan hasil panahan. 4(1), 45–54.
- Jufrizal, Jafar, M., & Razali. (2018). Hubungan Keseimbangan Dengan Ketepatan Memanah Pada Atlet Perpani Aceh. *Angewandte Chemie International Edition*, 6(11), 951–952., 3(1), 10–27. <https://medium.com/@arifwicaksanaa/pengertian-use-case-a7e576e1b6bf>
- Ks, S. (2013). Keikutsertaan Masyarakat dalam Kegiatan Olahraga. *Media Ilmu Keolahragaan Indonesia*, 3(1). <https://doi.org/10.15294/miki.v3i1.2656>
- Kualitas, P., Sumur, A., & Halmahera, M. (2024). *Interaksi : Jurnal Pengabdian Kepada Masyarakat* *Interaksi : Jurnal Pengabdian Kepada Masyarakat*. 1, 20–26.
- Mada, U. G. (2023). *Cabang Olahraga Panahan Indonesia Pada Olimpiade Seoul 1988 MUHAMMAD HILMAN D I, Baha’uddin, M.Hum.*
- Maksum, A. (2012). *Metodologi Penelitian Dalam Olahraga*. Surabaya: Unesa Universitas Press.
- Mukarromah, S. B., Soegiyanto, Ali, M. A., Rahayu, S., Hadi, & Yudha, D. W. (2017). Survei Status Gizi Atlet Pplop Provinsi Jawa Tengah Tahun 2017. *Jendela Olahraga*, 2(2), 77–83. <https://doi.org/10.26877/jo.v2i2.1705>
- Pamungkas, D. (2019). *SURVEI TINGKAT PENGETAHUAN GIZI PELATIH*. 11(02), 1646–1651.
- Penjakora, J., Teofa, B., Wibafiet, P., Yachsie, B., & Suhasto, S. (2021). *PANAHAH*. 8(September), 141–150.
- Raharja, D. S. P., Kusmaedi, N., Ma’mun, A., & Berliana. (2021). Sports facilities and local government policy: A case study in West Java, Indonesia. *International Journal of Human Movement and Sports Sciences*, 9(4), 71–76. <https://doi.org/10.13189/saj.2021.091312>

- Raharjo, S. (2014). Survey pplp panahan mandiri bojonegoro jawa timur. *Jurnal Sport Science*, 4(3), 166–172. <https://media.neliti.com/media/publications/211152-none.pdf>
- Rahma, F., Islami, R., Hariadi, I., & Hasanah, Z. (2024). *Pengembangan Variasi Latihan Kekuatan pada Cabang Olahraga Panahan Kabupaten Kediri Usia 10-15 Tahun Universitas Negeri Malang , Indonesia panahan Kabupaten Kediri usia 10-15 tahun ini terdapat 3 fase : 1) model penelitian dan. 2(4).*
- Saparuddin, S. (2019). Pengaruh Latihan Push-Up Dan Pull –Up Terhadap Kekuatan Otot Lengan Pada Atlet Panahan Perpani Kabupaten Banjar. *Riyadhoh : Jurnal Pendidikan Olahraga*, 2(2), 36. <https://doi.org/10.31602/rjpo.v2i2.2480>
- Taufik, A., & Mus'id, R. (2020). Pengembangan Instrumen Penilaian Olahraga Panahan Pada Pemulauntuk Guru Penjas Tingkat Sekolah Menengah Pertama, Kecamatan Praya, Kabupaten Lombok Tengah. *Jurnal Ilmiah Global Education*, 1(1), 58–67. <https://doi.org/10.55681/jige.v1i1.87>
- Utomo, A. W. (2018). Analysis Strength, Weaknesses, Opportunities, and Threats (SWOT) Pembinaan Prestasi Atlet Panahan di Mayangkara Archery Club Lamongan. *Jurnal Kesehatan Olahraga*, 6(2), 96–107.
- Yunida, E., Sugiharto, S., & Soenyoto, T. (2017). Manajemen Pembinaan Merdeka Basketball Club (MBBC) Pontianak Kalimantan Barat Tahun 2016. *Journal of Physical Education and Sports*, 6(2), 125–132. <https://journal.unnes.ac.id/sju/index.php/jpes/article/view/17385>