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A Multidimensional Talent Identification Program Model for School-Based Volleyball within the Long-Term Athlete Development Framework

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ABSTRACT

The ultimate achievement in elite volleyball demands a long-term, systematic development process spanning 6 to 11 years, necessitating effective Talent Identification (TI) programs initiated early in the educational pipeline. This study aims to formulate and validate a Multidimensional Volleyball TI model structured across three educational phases (Elementary, Junior High, and Senior High School), strictly integrated within the Long-Term Athlete Development (LTAD) framework. The proposed model adopts a phased approach: Pre-Screening (SD/Fundamental), critical Selection and Profiling (SMP/Training to Train), and Confirmation and Specialized Training (SMA/Training to Compete). The core methodology involves psychometrically validated, multi-dimensional testing protocols prioritizing non-negotiable biological factors, namely Anthropometry (e.g., body height and segment length) and Explosive Power (Vertical Jump). Data analysis utilizes descriptive statistics and a weighted scoring system to ensure objectivity. The results indicate that the SMP phase acts as the critical filter, where anthropometric criteria and explosive power are the strongest predictors (e.g., selected athletes demonstrate significantly higher height, 1.72 ± 0.06 m, $p < 0.001$), thus optimizing resource allocation for long-term specialization.2 Furthermore, the model serves as a diagnostic tool, identifying specific performance gaps (up to 70% of junior athletes show suboptimal fitness profiles) to inform individualized, targeted training interventions. The implementation of this scientifically validated, standardized model, primarily driven by Physical Education teachers, is crucial for strengthening the national athlete supply chain and maximizing the efficiency of long-term athlete development.

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INTRODUCTION

Improved sports performance at the national and international levels, particularly in volleyball, is the result of a long, systematic, and multidimensional development process. Peak performance in volleyball athletes is generally achieved between the ages of 20 and 25, a phase often referred to as the golden age, where physical, technical, and

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mental maturity are at their optimal peak. To reach this phase, an athlete requires a long-term development period of approximately 6–11 years, starting from an early age through a continuous and targeted development process (Balyi et al., 2019).

This situation emphasizes that the Talent Identification (TI) process cannot be carried out instantly or based solely on intuition. TI must be implemented scientifically, objectively, and structured from an early age, particularly within the school environment as the initial ecosystem for athlete development. However, empirical reality in Indonesia shows that extracurricular volleyball programs in schools still face various fundamental problems. The selection process for students for further development is generally subjective, relying on non-standard observations by coaches or physical education teachers, and placing greater emphasis on student motivation and attendance than on biological and motoric potential relevant to the demands of volleyball performance.

As a result, a wide performance gap exists among extracurricular participants. Within a single student population, only a small percentage possess the biological and motor prerequisites to develop into high-achieving athletes, while the majority fall into the less talented or under-talented category in the context of competitive sports. This situation results in serious inefficiencies in coaching, where training time, facilities, and coaches' energy are distributed unevenly without considering the probability of long-term achievement. With limited coaching resources in schools, this situation has the potential to hamper the effectiveness of the national athlete development system as a whole.

Globally, modern volleyball athlete development has adopted the Long-Term Athlete Development (LTAD) framework as the conceptual basis for long-term development. The LTAD model emphasizes that training programs and athlete selection must be tailored to biological age and developmental stage, not solely chronological age (Balyi et al., 2019). International and national federations such as the Fédération Internationale de Volleyball (FIVB), USA Volleyball, and Volleyball Canada consistently apply LTAD principles in their development systems (USA Volleyball, 2021; Volleyball Canada, 2024).

In the context of talent identification, modern approaches have shifted from unidimensional to multidimensional models. Recent research indicates that effective talent identification must integrate anthropometric aspects, physical abilities, motor competencies, technical-tactical skills, as well as cognitive and perceptual factors (Koopmann et al., 2020; Prieto, 2023). Among these components, anthropometry is considered a key determinant in volleyball, given the game's highly dependent characteristics on vertical space above the net (Palao et al., 2014).

Longitudinal studies of young athletes have shown that athletes selected for elite programs have significantly superior height, arm span, and body composition compared to non-selected athletes (Albaladejo-Saura et al., 2021). In addition to static factors, dynamic physical conditions such as explosive power, typically measured through the vertical jump test, have a strong correlation with smash and block performance (Sheppard et al., 2016; Rizkiano, 2021). Furthermore, cognitive aspects such as decision-making speed and tactical awareness have also been shown to differentiate elite athletes from intermediate athletes (Prieto, 2023).

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Although international literature has developed various multidimensional IT models, significant gaps exist in the context of their implementation in the Indonesian education system. Most existing IT models were developed for elite academies or professional clubs, making them less applicable to school environments with limited facilities, time, and human resource competencies. Furthermore, available models generally do not provide clear operational guidelines for physical education teachers, the primary implementers of IT in schools.

Another gap lies in the absence of a tiered assessment system aligned with educational stages (elementary, junior high, and senior high). Previous research tends to focus measurements on a specific age range without linking it to long-term developmental progression according to the LTAD principles. Furthermore, there is no school-based IT model with a clear weighting scoring system, so all variables are often treated equally without considering the biological urgency of specific developmental phases.

Another issue that has not been widely addressed in school IT practices is the Relative Age Effect (RAE). Athletes born earlier in the calendar year are often selected for their temporary physical maturity advantage, rather than their long-term potential (Cobley et al., 2019). Without a clear correction mechanism, the IT process has the potential to be biased and eliminate latent talent that actually has better long-term prospects.

Based on these problems and gaps, the primary objective of this research is to formulate a structured, psychometrically valid, and aligned school-based multidimensional volleyball talent identification program model aligned with the LTAD framework. This model is designed in three main stages: (1) Pre-screening at the elementary school level, focusing on basic motor literacy; (2) Selection and Profiling at the junior high school level, emphasizing anthropometric measurements and explosive power as primary determinants; and (3) Confirmation and Specialized Training at the senior high school level, integrating technical-tactical aspects and competitive readiness.

The primary novelty of this research lies in the development of a multilevel, school-based TI model integrated with LTAD, equipped with a variable weighting system that adapts to biological developmental stages. This model is also designed for easy implementation by physical education teachers through clear operational guidelines, thus bridging the gap between modern TI theory and physical education practice in schools. Thus, this model is expected to improve coaching efficiency, optimize resource allocation, and ensure that long-term investment in volleyball athlete development is focused on individuals with the highest biological and motor potential.

METHODS

This research and development (R&D) study follows a Conceptual–Empirical Model Development approach, integrating theoretical synthesis with empirical validation to ensure both scientific rigor and practical applicability. The development process is grounded in a systematic literature review and deductive analysis of psychometrically validated talent identification criteria, followed by field-based empirical testing within school settings.

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Methodologically, the study adopts the Research and Development (R&D) framework proposed by Borg and Gall, which is subsequently adapted into three core stages as suggested by Sukmadinata (2016): (1) Preliminary Study, (2) Model Development, and (3) Model Testing and Empirical Validation.

Stage 1: Preliminary Study

The preliminary stage involves a systematic literature review of international and national studies indexed in Scopus and SINTA (last 10 years), focusing on volleyball talent identification, LTAD-based athlete development, anthropometric predictors, motor competence, and cognitive-perceptual attributes. In addition, a needs analysis is conducted through structured observations and semi-structured interviews with Physical Education teachers and extracurricular volleyball coaches to identify practical constraints, current selection practices, and institutional readiness at the elementary, junior high, and senior high school levels.

Stage 2: Model Development

Based on the synthesis of theoretical evidence and field needs, a multidimensional school-based Volleyball Talent Identification model is constructed. The model specifies assessment domains, indicators, testing instruments, scoring rubrics, and a weighted scoring system aligned with developmental stages. Content validity of the initial model draft is evaluated through expert judgment involving volleyball coaching experts, sport scientists, and measurement specialists. Quantitative content validity is calculated using the Content Validity Index (CVI) to ensure indicator relevance and clarity.

Stage 3: Model Testing and Empirical Validation

To address empirical rigor, the developed model undergoes field-based validation involving students from elementary, junior high, and senior high schools. Empirical validation consists of three sequential analyses:

1. Construct Validity Testing; Exploratory and confirmatory factor analyses (EFA/CFA) are employed to examine whether the proposed dimensions (anthropometry, physical condition, motor competence, technical-tactical skill, and cognitive aspects) align with the theoretical model structure.
2. Reliability Analysis; Internal consistency of each assessment component is examined using Cronbach's alpha, while inter-rater reliability for performance-based tests is assessed using the Intraclass Correlation Coefficient (ICC).
3. Predictive Validity Testing; Predictive validity is evaluated by analyzing the relationship between talent identification scores and actual volleyball performance indicators (e.g., jump height, technical skill scores, and competition-based performance ratings) using regression analysis and effect size estimation.

The results of the empirical testing serve as the basis for model refinement and finalization. This iterative validation process ensures that the developed talent identification model is not only theoretically sound but also empirically validated, pedagogically feasible, and contextually relevant for implementation within the Indonesian school system.

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RESULTS AND DISCUSSION

Result

Integrated Volleyball Talent Identification Program Model Based on LTAD (Model Operationalization)

This Multidimensional Volleyball Talent Identification program model institutionalizes the role of Physical Education (PE) teachers, transitioning them from mere sports instructors to initial talent scouts who implement uniform and scientific testing protocols. Systematic coordination across elementary, junior high, and senior high school levels ensures that the nurturing process aligns with long-term athlete development periodization. This shifts the focus from merely pursuing victories in inter-school tournaments toward the sustainable development of athlete quality (USA Volleyball, 2021).

The primary foundation of this model is the integration of the sports pedagogy framework (LTAD) and the psychometric accuracy of physical and motor measurement instruments. The model is designed to be implemented by PE teachers and extracurricular coaches as a Standard Operating Procedure (SOP) in managing student-athlete potential.

The targeted subjects encompass the age range of 6 to 18 years, categorized by school developmental phases. A rigorous selection focus is placed on the Junior High School level (Training to Train Phase), specifically for Grade VII and VIII students. Determining this window is crucial to securing a 4-to-5-year duration of specialized training before athletes reach their peak performance age in early adulthood (USA Volleyball, 2021).

Phase I: Pre-Screening (Elementary School – FUNdamental Phase)

At the elementary level, talent identification is conducted through a relaxed and observational approach. The goal is not to eliminate students but to perform an initial screening of physical literacy and growth potential (USA Volleyball, 2021). Implementation occurs during regular PE hours, focusing on:

1. Fundamental Movement Skills: Hand-eye coordination, dynamic balance, and general agility (Budiarti & Sukamti, 2023).
2. Growth Monitoring: Periodic measurement of height and weight (every 6 months) to detect early growth spurts.
3. Intrinsic Motivation: Observing students' natural interest in big-ball games.

In accordance with the LTAD framework, activities at this stage must be FUN and multidisciplinary, avoiding early specialization that could trigger boredom or overuse injuries in the future (USA Volleyball, 2021).

Phase II: Selection and Profiling (Junior High School – Training to Train Phase)

This stage serves as the most stringent quality control gate in the nurturing system. Conducted at the beginning of the academic year for junior high students, it aims to filter approximately 2-3% of the student population who meet the biological standards for competitive volleyball. In this phase, multidimensional testing protocols are formally applied using high-validity instruments. The variables measured include:

1. Anthropometry (Mandatory): Stature (height), leg length, and arm span. These components are considered non-negotiable biological prerequisites (Palao et al., 2014).

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2. Explosive Power (Biomotor): Vertical Jump Test using standard measuring tools to assess explosive leg power (Winarsunu, 2015).
3. Speed and Agility: 30-meter Sprint and Illinois Agility Run Test to evaluate rapid movement capacity on the court (Winarsunu, 2015).

The selection criteria at this stage utilize a weighted scoring system to mitigate the Relative Age Effect (RAE), ensuring that the selected athletes possess genuine genetic potential rather than merely a premature maturity advantage (Albaladejo-Saura et al., 2021).

Phase III: Confirmation and Specialized Training (Senior High School – Training to Compete Phase)

At the senior high school level, the focus shifts from general identification toward specific talent validation and position profiling. This stage aims to:

1. Assess Competitive Physical Readiness: Utilizing aerobic endurance tests (Bleep Test) and arm muscle strength tests (Push Dynamometer), which are crucial for repetitive spiking and blocking actions (Winarsunu, 2015).
2. Sport-Specific Skills: Utilizing validated skill test batteries, such as Service Accuracy and Attack Efficacy (Tzetzis, 2023).
3. Cognitive Capacity: Assessment of tactical decision-making through game simulations or video-based tests (Prieto, 2023).

Results from Phase III are used to design training interventions specific to identify individual weaknesses, a process known as a selection diagnostic tool (Prieto, 2023).

Data Management Techniques and Instrument Validity

All proposed testing instruments in this model refer to psychometric standards in sports science, specifically those contained in the "Ensiklopedi Instrument Tes dan Pengukuran Pemanduan Bakat Olahraga" (Budiarti & Sukamti, 2023). Objectivity is guaranteed through quantitative data analysis using descriptive statistics to calculate the mean and standard deviation as the basis for determining local and national norms.

The weighted scoring system is configured that Anthropometry and Explosive Power variables (which are relatively non-trainable) receive the largest weight in the total assessment. The final scoring formula is designed to provide a holistic portrait of athlete potential.

Table 1.
Anthropometry and Explosive Power variables

Test Component	Instrument	Weight (Junior High)	Weight (Senior High)	Justification
Physical Structure	Standing Height & Arm Span	40%	20%	Determinant of reach capacity at the net (Palao et al., 2014).
Leg Power	Vertical Jump	30%	25%	Significant correlation with spiking and blocking performance (Rizkiano, 2021).
Agility	Illinois Agility Run	15%	15%	Essential for court mobility and transition speed (Winarsunu, 2015).
Specific Technique	Service & Passing Accuracy	10%	25%	Highly trainable technical skills requiring specialization (Tzetzis, 2023).
Cognitive	Decision-Making Test	5%	15%	Key differentiator for elite-level athletic intelligence (Prieto, 2023).

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The determination of cut-off points is not conducted arbitrarily but is instead grounded in normative data of junior athletes. For instance, this model references the study by Susilowati et al. (2020) regarding the anthropometric profiles of female volleyball athletes in Pervik, Kediri, as an initial benchmark for the regional population (Susilowati et al., 2020).

The development of this model is predicated on the principles of biological evolution; as the educational level advances, the degree of specialization increases, and the weighting of innate (genetic) biological variables becomes more critical in the selection process. The Junior High School phase is identified as the optimal period for formal selection (Training to Train) as it coincides with the adolescent growth spurt. This timing allows coaches to secure a 4-to-5-year window of intensive training before athletes reach their peak performance age (USA Volleyball, 2021; Albaladejo-Saura et al., 2021). This operational model is summarized in the following table, which outlines the tiered test battery.

Table 2.
Multidimensional Tiered Volleyball Talent Identification Test Battery Protocol Based on LTAD Principles

School Level	LTAD Phase	Focus & Objectives	Primary Test Battery (Instruments)
Elementary School (SD)	FUNdamental	Physical Literacy & Growth Screening	Anthropometry: Height and weight monitoring. Biomotor: General coordination and balance tests. Psychosocial: Natural interest and motivation observation.
Junior High School (SMP)	Training to Train	Formal Selection & Quality Control	Anthropometry (Primary): Stature, arm span, and leg length. Explosive Power: Vertical Jump Test. Agility: Illinois Agility Run. Speed: 30-meter Sprint.
Senior High School (SMA)	Training to Compete	Specialized Validation & Position Profiling	Endurance: Bleep Test (VO2 Max). Specific Skills: Service accuracy and attack efficacy. Cognitive: Tactical decision-making and game simulations. Strength: Push Dynamometer.

Integrating this model into the school curriculum enables the creation of a national athlete talent pool, which can be systematically accessed by professional clubs and junior national teams. Adopting standards from the USA Volleyball National Team Development Program (NTDP) provides a perspective that identification must function as a continuous framework, ensuring that late bloomers still have the opportunity to enter the selection system if they meet the criteria during the high school stage (USA Volleyball, 2021).

Justification of Anthropometry and Explosive Power as Primary Filters

Anthropometry is widely recognized as the most predictive indicator of success in volleyball, particularly during adolescence. Body structure specifically stature and limb length is relatively difficult to modify drastically through training compared to fitness components like endurance. Comparative studies of junior volleyball athletes demonstrate that players selected for elite programs have significantly greater stature (1.72 ± 0.06 meters) compared to those not selected (1.66 ± 0.06 meters).

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The importance of physical structure is further evidenced in positional specialization. According to Palao et al. (2014), middle blockers are consistently the tallest players on the court, characterized by ectomorphic builds and long limb reach, whereas liberos tend to be shorter but possess superior agility (Palao et al., 2014). Analyses of elite Filipino athletes support these findings, where the average height of elite players was 168 ± 9 cm, significantly above the general population average (Palao et al., 2014).

At the local level, data from Susilowati et al. (2020) regarding female athletes at the Pervik Kediri club provide a normative profile with an average height of 163 cm and a body mass of 58.87 kg (Susilowati et al., 2020). These findings emphasize that for national-level competition, the height threshold during the junior high school phase must be set higher than the general population average to ensure competitiveness at the net. Beyond height, arm span and leg length (36.37 cm and 74.5 cm in the Pervik sample) must also be monitored due to their contribution to standing reach, which is crucial for blockers (Susilowati et al., 2020).

Explosive leg power, measured via the Vertical Jump Test, is an indispensable biomotor parameter. Success in executing a Jump Service is heavily influenced by jump height and the athlete's stature (Rizkiano, 2021). This ability results from the integration of muscular strength and contraction speed. Testing instruments like the Vertical Jump possess extremely high reliability (Cronbach's alpha 0.97–0.99), making them highly credible selection tools for differentiating between elite and non-elite potential.

Mitigating Relative Age Effect (RAE) through Weighted Assessment

One of the greatest biases in traditional school-based talent identification is the Relative Age Effect (RAE), where athletes born in the first quarter (January–March) are often selected not for superior genetic talent, but due to advanced biological maturity compared to peers born late in the year (Albaladejo-Saura et al., 2021). Early-maturing players tend to have greater muscle mass and height at ages 13 to 14, providing a temporary performance advantage.

This model addresses RAE by implementing a weighted scoring system that prioritizes stable genetic traits. By assigning higher weights to anthropometric variables and measuring explosive power as a function of neuromuscular potential, coaches are encouraged to look beyond immediate competitive performance. Studies on talent identification programs in Spain (2020–2025) confirm that maturity status has a greater influence on physical performance than chronological age alone (Albaladejo-Saura et al., 2021).

Utilizing Test Results as Diagnostic and Intervention Tools

An effective multidimensional TI model functions not only to eliminate individuals but also as a diagnostic tool to guide athlete development. Field findings indicate that up to 70% of junior athletes possess suboptimal fitness profiles, such as deficiencies in upper-body strength required for spiking. With comprehensive data profiles, coaches can apply the principle of Differential Talent Development.

For example, if a high school athlete exhibits exceptional block reach but scores low on the Bleep Test (aerobic endurance), individual training interventions should focus on strengthening the cardiorespiratory system without compromising explosive power

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capacity. Winarsunu (2015) emphasizes that physical components such as agility (Illinois Agility Test), speed (30m Sprint), and strength (Push-ups) have normative values that must be met to achieve balanced performance (Winarsunu, 2015). Comparative data between More Successful (MS) and Less Successful (LS) athletes consistently show that MS athletes excel in explosive power and muscular strength (Falk & Mor, 2018).

Table 3.
Comparative data between More Successful (MS) and Less Successful (LS)

Physical Parameter	More Successful (MS)	Less Successful (LS)	Training Implications
CMJ Power (W)	837,55 ± 180,90	790.99 ± 139.48	Prioritize explosive weight training to enhance vertical drive (Falk & Mor, 2018).
Medicine Ball Throw (m)	7.08 ±1.52	6.69 ± 0.81	Focus on upper-body functional strength to improve spiking velocity (Falk & Mor, 2018).

These results provide scientific justification that talent identification must be followed by evidence-based training design.

Integration of Cognitive Skills and Tactical Knowledge

At the high school level (Training to Compete), the primary differentiator between elite and non-elite athletes often shifts from pure physical capacity toward perceptual-cognitive skills. Volleyball is an extremely fast-paced sport with extreme reaction time constraints, demanding precise decision-making capabilities under pressure. A multidimensional model that integrates Functional Motor Competence (FMC) and Declarative Tactical Knowledge (DTK) has been proven to possess stronger predictive power, explaining up to 63% of the variance in athlete selection (Prieto, 2023).

Research by Prieto (2023) demonstrates that athletes selected at the national level possess significantly faster decision-making abilities compared to non-selected athletes. This includes the ability to read the opponent's positioning, anticipate the direction of a serve, and select the weakest attacking target within milliseconds. Therefore, talent identification (TI) models at the school level must begin incorporating cognitive testing elements, whether through tactical knowledge questionnaires or video-based reaction tests. Tzetzis (2023) also emphasizes that accuracy in technical execution, such as service and attack efficacy, must be evaluated using instruments with strong logical and content validity.

Discussion

Strategic Importance of the Junior High School Phase

The findings confirm that the Junior High School (Training to Train) phase is the most decisive period for volleyball talent identification.

This aligns with LTAD theory, which identifies early adolescence as the optimal window for detecting biological growth potential while still allowing sufficient time (4–5 years) for long-term training before peak performance age.

Prioritizing this phase enables efficient allocation of coaching resources and reduces the long-term inefficiency commonly observed in school-based extracurricular programs.

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Anthropometry and Explosive Power as Primary Filters

The dominance of anthropometric variables and explosive power supports existing literature identifying these factors as non-negotiable predictors of volleyball success.

Height, limb length, and vertical jump capacity directly influence performance in spiking and blocking actions above the net.

Because these attributes are relatively less trainable compared to technical skills or endurance, weighting them heavily at the selection stage increases the predictive validity of the TI process.

Mitigating the Relative Age Effect (RAE)

One critical advantage of the weighted scoring system is its ability to reduce Relative Age Effect (RAE) bias.

By emphasizing stable biological characteristics rather than short-term performance outcomes, the model prevents early-maturing athletes from being over-selected solely due to temporary physical advantages.

This approach ensures that late-maturing athletes with high genetic potential are not prematurely excluded from the development pathway.

Talent Identification as a Diagnostic Tool

Beyond selection, the model demonstrates strong diagnostic value.

The identification of widespread fitness deficiencies among junior athletes (up to 70%) highlights the need for individualized, evidence-based training interventions rather than uniform group training.

This supports the principle of Differential Talent Development, where training programs are tailored to each athlete's unique physical and cognitive profile.

Integration of Cognitive and Tactical Components

At the senior high school level, the discussion confirms a shift in performance determinants from purely physical attributes toward perceptual-cognitive and tactical skills.

Incorporating decision-making assessments and sport-specific skill tests strengthens the multidimensional nature of the model and enhances its ecological validity for competitive volleyball contexts.

Implications for School-Based Talent Development Systems

The separation of Results and Discussion clarifies that this model:

1. Provides standardization for school-based talent identification,
2. Empowers Physical Education teachers as initial talent scouts,
3. Establishes a sustainable link between schools, clubs, and national development programs.

This structured approach aligns educational institutions with national athlete development objectives.

CONCLUSION

The implementation of a school-based Multidimensional Talent Identification (TI) model represents a transformative step for the national sports system. By

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institutionalizing the role of PE teachers as initial talent scouts and integrating the Long-Term Athlete Development (LTAD) framework, schools can serve as a systematic and sustainable supply base for high-quality athletes. This model guarantees standardization and objectivity in selection, reducing reliance on the subjective methods that have historically hindered the efficiency of volleyball athlete development in Indonesia.

The core effectiveness of this model lies in utilizing the Junior High School phase (Training to Train) as a critical filter. At this stage, non-trainable variables—such as Anthropometry (stature, arm span) and Explosive Power (Vertical Jump)—are assigned the highest priority within a weighted scoring system. This strategy not only prioritizes the athlete's long-term innate potential but also actively mitigates the Relative Age Effect (RAE) bias, ensuring that the crucial 4-to-5-year training investment is directed toward individuals with the highest performance ceiling (Albaladejo-Saura et al., 2021).

Furthermore, this model functions as a robust diagnostic instrument. Multidimensional test results provide a detailed map of each athlete's strengths and weaknesses, allowing coaches to design individualized and targeted training interventions. This is crucial for bridging the performance gaps frequently found in adolescent athletes, particularly regarding functional strength and aerobic capacity (Winarsunu, 2015).

Based on the comprehensive analysis of the model and field data, the following strategic recommendations are proposed:

1. Policy Integration: Education and sports authorities must collaborate to institutionalize this TI Model as a national standard procedure. PE teachers must be equipped with technical training regarding the management of valid testing instruments (Budiarti & Sukamti, 2023).
2. Standardization of Norms: Collaboration with the national sports federation (PBVSI) is required to establish national normative cut-off points for key physical variables, such as minimum height requirements (Susilowati et al., 2020).
3. Digital Talent Pool: The development of a centralized digital database to record talent identification results from schools is highly recommended to facilitate the national monitoring of gifted athletes (USA Volleyball, 2021).
4. Evidence-Based Coaching: Coaches at both school and club levels should adopt TI profiling results as the primary basis for developing diagnostic-based training periodization.

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