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FORKI Bone Karate Athlete Simulation: A Cost-Efficiency Strategy for the Training Center in Preparation for the 2026 South Sulawesi Provincial Sports Week

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ABSTRACT

The South Sulawesi Provincial Sports Week (Porprov) karate competition is planned for 2026, while most FORKI Bone Regency athletes reside outside Watampone, with many studying or working in Makassar. As a result, the centralised training (training center) faces constraints related to distance, time, and cost. To date, financial support from KONI and FORKI has not yet materialized, making it necessary to develop a preparation model that is both efficient and measurable. This community service program aims to map the existing conditions of athletes by class (kumite and kata) as a basis for designing an independent training plan directed by FORKI Bone's Performance Division (Binpres) and the respective kumite or kata specialist coaches. The method employed is a structured match simulation used as an alternative to a full training center, consisting of: (1) needs assessment and athlete classification by class or weight; (2) technical–tactical briefing; (3) tiered match simulations (situation drills, sparring, and full-match simulations with referee roles); (4) measurement of key indicators (kumite or kata technical–tactical rubric, penalty scores, attack effectiveness, kiai or rhythm consistency, and functional physical components); and (5) individualized feedback and a microcycle-based independent training plan. The program is implemented through collaboration between the Sports Science Student Association under the BEM of the Faculty of Science and Technology at Universitas Cahaya Prima and FORKI Bone Regency, with supervision from lecturers and the head of the Sports Science Study Program. The expected outcomes include: (a) baseline performance profiles of each athlete by class; (b) a map of technical and tactical needs; (c) a package of independent training recommendations and a monitoring schedule; and (d) cost efficiency in preparation by substituting a portion of the training center activities with structured simulations. Program sustainability is planned through periodic simulations and performance monitoring leading up to Porprov 2026, integrated into FORKI Bone's Binpres agenda and student development through service-learning.

INTRODUCTION

The dispersed residential locations of FORKI Bone athletes many living outside Watampone and several studying in Makassar, create substantial cost and time barriers to centralized training (training centers). With financial support from KONI/FORKI not yet realized, a cost-efficient strategy is required without compromising the quality of preparation. The main problem faced by the partner is that centralized preparation cannot be implemented consistently due to limited funding, the wide geographical spread of athletes, and logistical

difficulties that prevent regular joint training. This condition makes it necessary to design an alternative mechanism that still provides measurable performance evaluation.

Based on initial situation analysis conducted with FORKI Bone, the federation currently manages more than 30 active karate athletes distributed across several dojos (INKANAS, BKC, and others). Approximately 40–50% of athletes live outside Watampone, with a dominant cluster in Makassar, resulting in high transportation and lodging expenses if a full training center is enforced. Historically, FORKI Bone has shown competitive potential in regional events, but preparation inconsistency has often limited performance outcomes. These contextual facts strengthen the need for a preparation model that is realistic, affordable, and aligned with the partner's actual conditions.

Scientifically, match simulations have been shown to produce physiological responses and movement profiles comparable to official competitions, making them a valid platform for performance assessment and tactical preparation (Chaabène et al., 2013; Chaabène et al., 2015). This approach also supports cost efficiency, as part of the training center load can be replaced by structured simulation sessions while maintaining safety and compliance with WKF regulations (Lystad et al., 2020; Rosso et al., 2023). For managing training load toward pre-event peak performance, microcycle periodization and tapering principles are relevant to incorporate into the sustainability plan (Martínez-Rodríguez et al., 2025; Nanclerio et al., 2013; Ouergui et al., 2022; Turner, 2011)In the technical domain of assessment, the reliability of kata judging and the use of digital scoring boards enhance objectivity and transparency in the evaluation process (Augustovicova et al., 2020; Hinayah et al., 2024; Ziaee et al., 2015). Considering that some athletes reside outside the city, recent literature also highlights the effectiveness of remote training (supervised livestreams, recorded sessions, and written programs) as supportive options outside in-person sessions (Daveri et al., 2022; Li & Li, 2022).

The general objective of this community service initiative is to optimize FORKI Bone athletes' readiness for the 2026 South Sulawesi Provincial Sports Week (Porprov Sulsel) through cost-efficient tiered match simulations. The specific objectives are to: (1) assess the existing conditions of each athlete and their respective class (kumite or kata); (2) develop individualized microcycle-based independent training plans; (3) establish key performance indicators (KPIs) and baseline metrics for quarterly monitoring through 2026; and (4) evaluate the feasibility of the simulation model as an alternative to training centers in terms of cost, logistics, and participation.

The primary partner in this program is the Indonesian Karate-Do Federation (FORKI) of Bone Regency, chaired by M. Awaluddin A., with Andi Khadafi serving as Head of the Performance Division (Binpres), Dian as Binpres Member, Derry as Deputy Secretary, and Andi Santi as Head of the Referee Council. The implementing team at the university level is the Sports Science Student Association under the Student Executive Board (BEM) of the Faculty of Science and Technology, Universitas Cahaya Prima. The program is also supervised by Muhammad Sulfa, Head of the Sports Science Study Program and student PKM mentor, along with Andi Abdul Rahman as the faculty advisor responsible for methodological, ethical, and evaluation oversight. The Student Implementation Team (PKM) consists of Riska Dwi Saputri as PKM Chair, with members Aldy Saputra, Cendana Untarolla, Resy Sarita, Widia Lestari, and Naufal Vicdan Azzuljalal.

IMPLEMENTATION METHOD

The implementation of this program uses a structured match-simulation approach designed to provide a realistic depiction of athletes performance in conditions closely resembling actual competition. As a community engagement initiative, this program applies a participatory service-learning approach, where FORKI Bone, coaches, referees, athletes, lecturers, and the Sports Science Student Association (*HIMA Ilmu Olahraga*) are actively involved in planning, executing, and evaluating the activities. This framework ensures that the simulation process is not only technical in nature but also serves as a collaborative capacity-building effort for the athlete community. The process begins with a needs assessment, which involves verifying athlete data, including competition class, body weight, domicile, and training history. This stage is essential as the foundation for pairing arrangements and aligning technical expectations. Following this, a technical and tactical briefing is conducted by coaches and referee officials, explaining performance indicators, safety procedures, the simulation flow, and rules based on the latest WKF regulations.

In this participatory model, stakeholder roles are clearly distributed: FORKI Bone provides coordination and policy direction; the Performance Division (Binpres) leads athlete classification and monitoring; coaches conduct technical and tactical supervision; the Referee Council ensures rule compliance and objective officiating; lecturers oversee methodological accuracy; HIMA manages data collection, documentation, and logistics; and athletes participate actively in both evaluation and feedback stages. This collaborative involvement reinforces the community-based nature of the simulation activities.

The core activity consists of tiered simulations, beginning with situation drills, controlled sparring, and progressing to full match simulations with assigned referee and judge roles. All sessions are recorded on video and documented using a digital scoring board to ensure objective evaluation. The collected data are then analyzed to provide individualized feedback, enabling each athlete to receive a microcycle-based independent training plan tailored to their technical, tactical, and physical needs. The series of activities concludes with the development of a periodic monitoring plan leading up to the 2026 Porprov, ensuring continuous development and performance improvement.

To increase clarity of the implementation stages, a flowchart of the method is provided (Figure 2). This flowchart visually summarizes the empowerment-based workflow from needs assessment to feedback and monitoring.

Figure 1. Technical Briefing and Simulation Activities of FORKI Bone Karate Athletes

The design used in this activity is a structured match simulation (technical–tactical pre-briefing → situation drills → sparring → full simulation with judging roles). The simulations are conducted across three sessions: Session 1 on November 2, 2025; Session 2 on November 5, 2025; and Session 3 on November 8, 2025, all held at the Matannatikka Sports Hall, Lapatau Stadium Complex, Tanete Riattang District, Bone Regency (main venue). Satellite venue options may be used depending on athlete domicile concentrations (e.g., Makassar). Participants in this program are FORKI Bone athletes (kumite and kata) listed in the official roster.

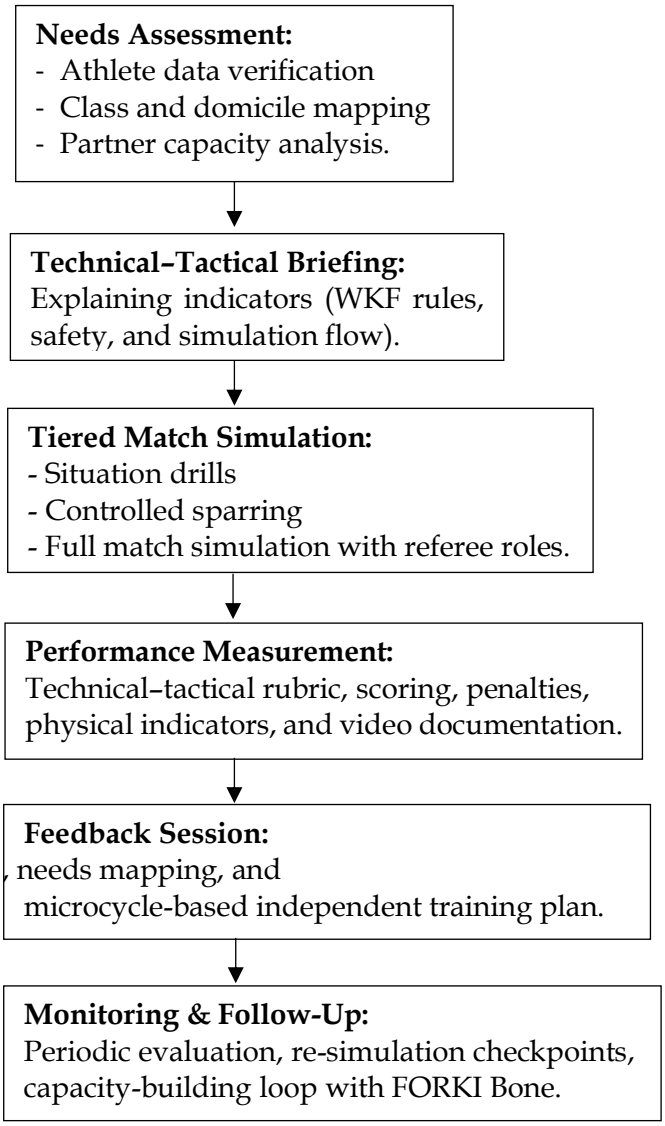

Figure 2. Flowchart of the FORKI Bone Karate Athlete Simulation Method

Simulation Equipment and Operational Rules

The match simulations are supported by standard karate competition equipment to ensure conditions comparable to official events. Equipment includes WKF (2023), standard mats with appropriate zones, an official panel of three members (referee and judges) responsible for scoring, and referee tools such as Aka–Ao flags and command equipment. A digital scoring board is operated using a laptop connected to a 32-inch LCD TV, allowing athletes and officials to monitor scoring in real time. Documentation is performed through

video recordings of each match for technical evaluation, while a sound system is used for instructions and match flow regulation. All equipment is prepared to ensure that simulations run safely, objectively, and in accordance with international rules.

Match duration for the Kumite category (male and female) is set at half of the official competition duration, while the Kata category follows the full official duration. Athlete drawing or randomization is carried out for simulation purposes, where male athletes compete with other male athletes even if from different classes, following existing technical policies. Additionally, four reserve athletes are prepared to support smooth operations. For safety, equipment inspections are conducted including mouthguards and body protectors and a briefing is provided on injury-handling procedures and match stoppage.

Role of the Sports Science Student Association and Logistic Requirements

The Sports Science Student Association (*HIMA Ilmu Olahraga*) plays a crucial role in program implementation, particularly in technical and logistical support. Core responsibilities include athlete data collection, such as verifying class/weight and domicile, and recording match results. HIMA also operates the digital scoring board using a laptop connected to a 32-inch TV and coordinates directly with referees and judges. For documentation, HIMA is responsible for taking photos and recording each match, then uploading the materials to Google Drive for athlete, coach, and Performance Division (Binpres) evaluation.

Logistical needs include referee and judging equipment such as red–blue flags, chairs, and administrative tables; mineral water for athletes, administrative teams, and referee–judge officials; and snacks for the administrative and judging teams. HIMA is additionally responsible for venue preparation, including mat arrangement, judge's area setup, athlete waiting area, sound-system preparation, and providing cables and power backup at the Matannatikka Sports Hall.

Evaluation Instruments and Indicators

Evaluation instruments and indicators consist of two main categories Kumite and Kata designed to assess athlete performance using standardized and research-based rubrics. For the Kumite category, assessment indicators include attack effectiveness (points per attempt), distance control, movement tempo or rhythm, transition from defense to counterattack (defense → counter), and penalties or point deductions. All indicators reference findings from time-motion analyses and determinants of winning outcomes as described by Chaabène et al. (2014; 2015). Beyond technical elements, athletes' functional physical abilities are evaluated, including agility using the reliable T-test (Pauole et al., 2000), specific endurance using the karate-specific intermittent demand test (Chaabène et al., 2015), and simple reaction time to measure response speed.

For the Kata category, assessment indicators include kihon (fundamental techniques), kime (sharpness and power), timing and rhythm, balance and sequence precision, and overall presentation. These assessments are supported by analytical templates and reliability guidelines outlined by Augustovicova et al. (2020) and Ziaee et al. (2015). A 1–5 rating scale is used for each indicator, with final scores derived from the total accumulated points combined with technical notes from the judges to inform evaluation and performance-improvement feedback for athletes.

RESULT AND DISCUSSION

The core part of this activity involves students from the Sports Science Student Association (*HIMA Ilmu Olahraga*) together with several athletes participating in the simulation. In addition to the main team, there are four additional reserve athletes. To distinguish participants, colored tape codes are used, namely M = Aka (red) and B = Ao (blue).

Table 1. Additional Reserve Athletes

Name	Dojo/Organization	Domicile	Age (Years)	Body Weight / Class
Akhmad Fadli A. Maudjik	INKANAS	Pangkep	17	73
Muh Raihan Fathin Efendi	INKANAS	Watampone	17	60.35
Tiara Akbar	INKANAS	Watampone	18	55.35
Keyla	BKC	Watampone	18	54.85

BW or Class will be mapped to the official class categories during the pairing process.

Table 2. Simulation Schedule

Stage	Activity	Time/Date	Person in Charge	Output
Needs Assessment	Roster, domicile, and class verification	4:00 PM WITA/01 Nov 2025	HIMA, Performance Division	Final list & pairing
Briefing & Initial Testing	Technical–tactical briefing & functional physical tests	7:00 PM WITA/01 Nov 2025	Coaches / Head Referee	KPI baseline
Tiered Simulation	Situation test → sparring → full simulation	9:00 AM WITA/02 Nov 2025	Referees/Judges, Coaches	Scores & video recordings
Feedback	One-on-one feedback & independent training package	4:00 PM WITA/02 Nov 2025	Coaches, Lecturers	Microcycle recommendations

Table 3. Results of the First Simulation Session

Match	Aka (Red)	Score	Ao (Blue)	Score	Winner
1	Fadlan	2	Ahmad Fadli	1	Aka
2	Farhan	0	Raihan	0	-*
3	Fikrah	5	Tiara	0	Aka
4	Putri	0	Kayla	0	Aka
5	Fadian	3	Farhan	3	Ao
6	Rehan	1	Fadly	3	Ao
7	Siti Salsabila	0	Meiranda	1	Ao
8	Salsabila	1	Tiara	1	Aka*
9	Fiqrah	3	Kayla	0	Aka
10	Putri	1	Meiranda	1	Ao*

*Rows marked with an asterisk indicate matches ending in a draw or unclear readings. Winners were determined by judge decisions (flag or criteria).

Table 4. Results of Second Simulation Session

Match	Aka (Red)	Score	Ao (Blue)	Score	Winner
1	Farhan	3	Fadli	2	Aka
2	Raihan	0	Farhat	2	Ao
3	Yusril	1	Bintang	3	Ao
4	Salsabila	2	Fiqrah	2	Ao*
5	Siti Salsabila	4	Kayla	0	Aka

Match	Aka (Red)	Score	Ao (Blue)	Score	Winner
6	Raihan	2	Fadlan	1	Aka
7	Yusril	0	Farhan	1	Ao
8	Farkah	3	Fadli	0	Aka

*Determined by judge decision (flag or criteria) in the case of a draw.

The following is a consolidated summary of evaluations taken from the field assessment sheets of Session 1 (held on November 2, 2025) and Session 2 (held on November 5, 2025). Columns that are not relevant to a given category are left blank.

Table 5a. Field Scoring Recap (KATA)

Date	Category	Class/ Name	Transi-tion	Kihon	Kime	Timing	Balance	Notes
2 Nov	KATA	Individual Kata Female: Anggi	4	4	5	4	3	Endurance lacking; power & kime need improvement
2 Nov	KATA	Individual Kata Male: Ferry Laodri	4	4	5	5	4	Timing needs practice; power should be increased; stances need stabilization
2 Nov	KATA	Individual Kata Female: Anggi (another session)	4	4	4	4	4	Power & endurance improved
2 Nov	KATA	Team Kata Male: Muh Aqil Pratama Ibrahim	2	2	2	2	2	Needs more practice
2 Nov	KATA	Team Kata Male: Cakra Surgantara	3	3	4	3	3	Improve stances; increase team uniformity
2 Nov	KATA	Team Kata Male: Riswan	3	3	3	3	4	Power & team cohesion need improvement
5 Nov	KATA	Team Kata Female: Lutfhfiyah Zabrina D. Sadeh	3	3	3	3	2	Endurance, kime, power & team uniformity need improvement
5 Nov	KATA	Team Kata Female: Nur Alicia Abigail	3	3	3	2	3	Power & kime improved; team uniformity corrected

Table 5b. Field Scoring Recap (KUMITE)

Date	Category	Class / Name	Effectiveness	Distance Control	Transition	Notes
2 Nov	KUMITE	Kumite 60 kg: Farhat Risman Pratama	3	4	3	Slow response; transitions lacking; agility needs improvement
2 Nov	KUMITE	Kumite 67 kg: A. Muh Bintang Faathir Aryan	3	3	3	Agility & timing need sharpening; maintain mental focus
2 Nov	KUMITE	Kumite 75 kg: Muh Farhan Maulana	5	5	5	Improve focus on opponent; maintain attitude
2 Nov	KUMITE	Kumite 75 kg: Muh Farhan Maulana	5	5	5	Focus on opponent improved; attitude maintained
2 Nov	KUMITE	Kumite 84 kg: Fadlan	3	3	2	Mental focus maintained; movement speed needs improvement
2 Nov	KUMITE	Kumite 50 kg: Putri Anggraeni Sari	3	3	2	Endurance, agility, power lacking
2 Nov	KUMITE	Kumite 55 kg: Fiqra Dwi Saskiah	4	4	4	Agility needs improvement
2 Nov	KUMITE	Kumite 61 kg: Meiranda Chelselia Rahmadani	4	4	3	Endurance & agility need enhancement
2 Nov	KUMITE	Kumite 68 kg: Sitti Shalshabila	3	3	3	Agility & power required
2 Nov	KUMITE	Kumite +68 kg: Salsabila Nur Qalbi	4	4	3	Agility & endurance need intensive training
5 Nov	KUMITE	Kumite +84 kg: Yusril	4	4	3	Endurance & agility lacking

General notes by category cover two main focuses: Kumite and Kata. In the Kumite category, training emphasizes improving agility through methods such as the T-test, enhancing the quality of transitions from defense to counterattacks, and developing endurance tailored to Kumite competition demands. Meanwhile, in the Kata category, the focus is on sharpening *kime*, maintaining consistent timing and rhythm, and ensuring stable stances and balance. For team Kata events, special attention is also given to improving team synchronization to achieve a cohesive and harmonious performance.

In addition to the descriptive match outcomes and rubric evaluations presented above, the simulation results provide important strategic implications for FORKI Bone preparation

toward the 2026 Porprov. The baseline data allow the Performance Development Division (Binpres) to classify athletes based on readiness level and specific developmental needs. Athletes with strong effectiveness, balanced timing, and consistent technical execution may be positioned as priority competitors during the selection phase, while those showing deficits in agility, endurance, or transition skills can be targeted for corrective microcycle programs. In this way, the simulation serves not only as an evaluation tool but also as a data-driven talent identification mechanism for FORKI Bone.

The results also have direct relevance for cost planning and resource distribution. Given that many athletes reside outside Watampone, those with stable baseline indicators may be assigned to structured independent or remote training plans, while athletes with greater technical gaps may receive more intensive monitoring. This approach aligns with research supporting hybrid and remote training modalities, such as supervised online sessions, asynchronous video feedback, and written conditioning programs which have been shown to effectively support athlete development outside centralized camps (Daveri et al., 2022; Li & Li, 2022). Thus, these baseline findings help FORKI prioritize which athletes require in-person sessions and which can be maintained through distance-based modalities, optimizing transportation and accommodation budgets.

From a sports science perspective, the observed patterns also correspond with key determinants of success in combat sports. Deficiencies such as slow counterattacks, poor distance control, limited endurance, or inconsistent tempo reflect performance variables commonly highlighted in time-motion analyses and combat periodization literature (Chaabène et al., 2013; Chaabène et al., 2014). Similarly, kata-related issues, such as kime inconsistency, unstable stances, and lack of team synchronization match known performance factors described in kata evaluation frameworks (Augustovicova et al., 2020). Therefore, the simulation not only describes athletes' conditions but also validates the training direction required, reinforcing the alignment between athlete needs, program design, and scientific recommendations for combat sports readiness. Overall, the findings help FORKI make informed decisions in selection, training prioritization, and long-term monitoring leading up to the 2026 Porprov.

Cost Efficiency Strategy

The cost efficiency strategy in this program is designed to address FORKI Bone budget limitations without compromising athlete preparation quality. The first approach involves grouping athletes by residence or creating residential clusters, allowing satellite training sessions to be held closer to athletes' homes, thereby significantly reducing the need for mass transportation to Watampone. Next, scheduled match simulations are used to replace much of the conventional training center sessions, reducing overnight stays, daily meal expenses, and other logistical needs.

Time and facility efficiency are further enhanced through a multi-pit system, which utilizes two mats in parallel to accelerate the number of matches and consolidate venue rental or usage time. Student involvement through a service-learning scheme also contributes significantly to cost reduction, as they handle video documentation, match administration, and scoring board operations without additional professional labor costs. Finally, collaboration with schools or karate dojos as alternative venues without rental fees allows the budget to be redirected toward higher-priority technical needs.

Table 6. Cost Comparison per Component (Budget Plan)

Component	2-Month Training Center (Rp)	7-Day Simulation (Rp)	Difference (TC − Sim)	Savings Percentage
Lodging/Dormitory	60,000,000	7,000,000	53,000,000	88.33%

Component	2-Month Training Center (Rp)	7-Day Simulation (Rp)	Difference (TC − Sim)	Savings Percentage
Makassar–Bone Transportation	5,200,000	5,200,000	0	0.00%
Local Transportation	12,000,000	2,800,000	9,200,000	76.67%
Meals (3× daily)	54,000,000	6,300,000	47,700,000	88.33%
Vitamins	12,000,000	1,400,000	10,600,000	88.33%
Training Drinks (2× daily)	36,000,000	4,200,000	31,800,000	88.33%
Laundry	12,000,000	1,400,000	10,600,000	88.33%
Venue & Mat Rental	0	0	0	0%
TOTAL	191,200,000	28,300,000	162,900,000	85.20%

The table above follows the partner's budget plan. Official expenses and documentation costs are included.

Table 7. Summary of Total Costs

Scheme	Total
7-Day Simulation (±20 participants)	Rp 28,300,000
2-Month Training Center (±20 participants)	Rp 191,200,000

Difference, Efficiency, and Analytical Notes

The comparison of total costs shows that the simulation scheme is far more cost-efficient than the conventional Training Center (TC). The total cost for a seven-day simulation is Rp 28,300,000, whereas a two-month TC requires Rp 191,200,000. This results in a cost difference of Rp 162,900,000. Using the efficiency formula, namely 1 − (Total Simulation ÷ Total TC), the efficiency level obtained is 85.20%. These findings indicate that the simulation model requires only about 14.8% of the total TC cost, making it a highly effective alternative for reducing expenses without compromising the quality of athlete evaluation and preparation.

Cost structure analysis reveals that in the two-month TC scheme, the three largest budget components are lodging (31.4%), meals three times daily (28.2%), and training drinks (18.8%). Together, these components account for approximately 78% of the total cost, representing the main drivers of the conventional TC's high budget requirement. In contrast, under the simulation scheme, the largest cost shares are lodging (24.7%), meals (22.3%), and Makassar–Bone transportation (18.4%), while venue and mat usage incur no costs as they are provided in-kind through partner collaboration. These findings reinforce that a scheduled simulation strategy combined with self-directed training is an effective approach to reduce daily expenses particularly for lodging, meals, and laundry while still maintaining evaluation quality through structured and standardized match simulations.

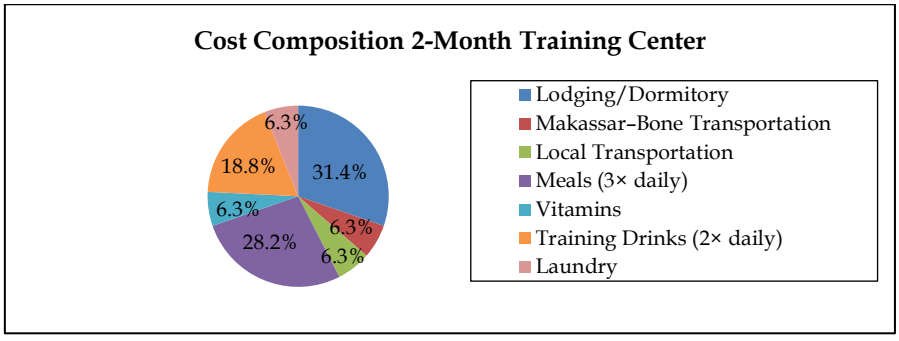

Figure 3. Pie Chart of the Cost Composition for the 2-Month Training Center

Figure 3 illustrates the proportion of cost components incurred during the two month training center. Lodging, three daily meals, and training drinks make up the largest share approximately 78% of the total budget highlighting the high daily expense burden of the conventional TC model.

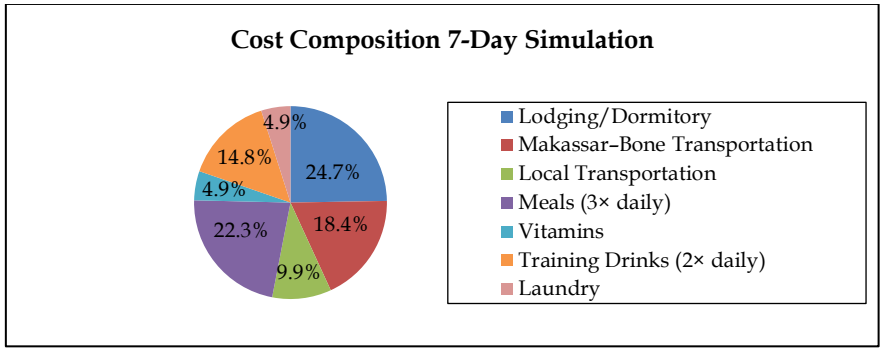

Figure 4. Pie Chart of the Cost Composition for the 7-Day Simulation

Figure 4 illustrates that in the simulation model, the cost distribution is more balanced and not burdened by long-term daily expenses. Lodging, meals, and Makassar–Bone transportation make up the largest components, while venue and mat usage do not contribute to the cost because they are provided in-kind through partner collaboration.

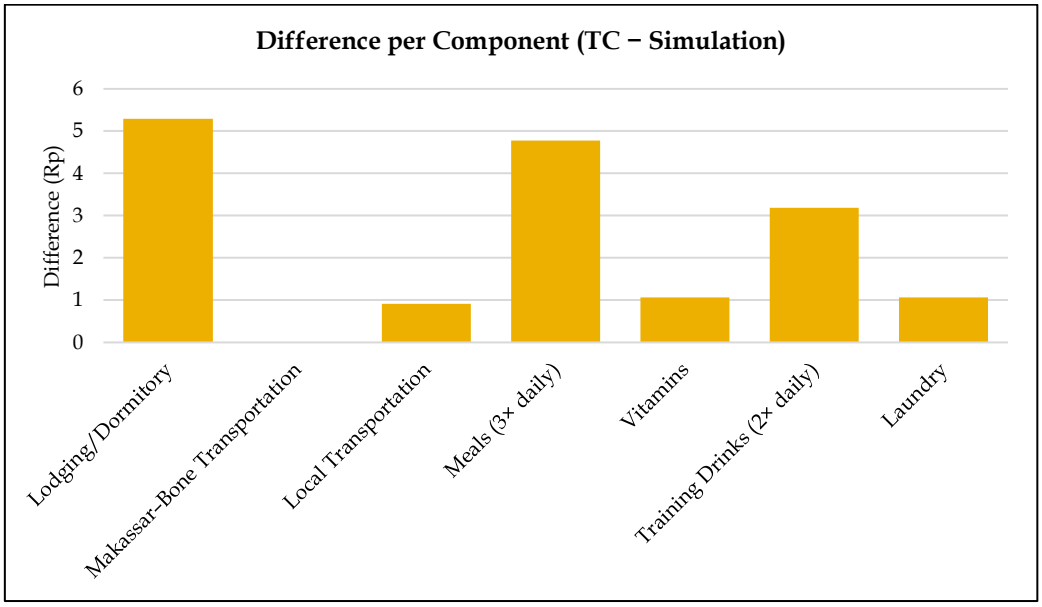

Figure 5. Difference per Component (TC − Simulation)

The difference-per-component chart in Figure 5 illustrates the amount of cost savings achieved through the simulation model. Lodging, meals, and training drinks are the three components with the highest savings, amounting to Rp 53 million, Rp 47.7 million, and Rp 31.8 million respectively. In total, cost efficiency reaches Rp 162.9 million, or approximately 85.20% compared to the two-month training center.

Sustainability Plan Through 2026

The program's sustainability plan is designed to ensure consistent athlete development for FORKI Bone leading up to the 2026 South Sulawesi Provincial Games (Porprov). Evaluations will be conducted through quarterly checkpoints in the form of brief simulations accompanied by performance indicator assessments to monitor each athlete's progress. Regular reporting will then be provided to the FORKI Bone Performance Development Division (Binpres) in the form of a concise dashboard to support decision-making regarding

training direction. As support for independent training, a video repository will be prepared containing match footage and analytical notes, enabling athletes to review techniques at any time. Approaching the competition period, selection and tactical refinement will be carried out within 3 to 6 months before the 2026 Porprov to ensure athletes reach optimal readiness in technical, physical, and mental aspects.

CONCLUSION

This community service program demonstrates that structured match simulations are an effective and efficient alternative to a substantial portion of training center (TC) activities for FORKI Bone athletes preparing for the 2026 Porprov. The simulations provide a comprehensive picture of athletes' technical execution, tactical decision-making, and functional physical readiness, while producing individualized training recommendations. The model also offers direct benefits for the community partner by generating baseline data that support athlete selection, technical priority setting, and more strategic budget planning. In addition to achieving an 85.20% cost efficiency compared to the conventional two-month TC, the program establishes a sustainable monitoring system through quarterly checkpoints, video documentation, and periodic reporting to the Performance Development Division (Binpres). These mechanisms enable FORKI Bone to maintain athlete development continuously throughout the preparation period rather than relying solely on centralized training camps.

The program also contributes to student learning outcomes, as members of the Sports Science Student Association gained practical experience in athlete assessment, match documentation, scoring operations, and event coordination. Overall, the simulation model represents an adaptive, economical, and data-driven approach that benefits both FORKI Bone and the participating students, while supporting long-term athlete development toward the 2026 Porprov.

ETHICAL STATEMENT

All participants were informed of the objectives of the activity and agreed to the use of score data and documentation for evaluation purposes. Participant identities will not be disclosed without their consent.

DATA AVAILABILITY

The roster recap and analysis summary are available as internal appendices and may be shared with FORKI Bone upon request.

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