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Improving Basketball Free-Throw Accuracy Through the BEEF Method: An Experimental Study in School-Based Extracurricular Players

¹Veny Juniarni Hardi*, ²Rafly Zaenal Malik, ³Alen Rismayadi

¹²STP Pasundan, Indonesia

³Universitas Pendidikan Indonesia, Indonesia

*Corresponding Author: venyjuniardi@gmail.com

Abstract: This study aims to determine the application of shooting exercises using the Beef method to the accuracy of free throws of basketball extracurricular students at SMP Negeri 1 Cicalengka. This study uses the pre-test and post-test one-group experimental method. The research population is students who actively participate in basketball extracurricular at SMP Negeri 1 Cicalengka. Sampling uses purposive sampling techniques so that 10 students are obtained as samples that meet the specified criteria. Data collection is carried out with a free -throw shooting skills test instrument and the movement process according to the Beef method approach (Balance, Eyes, Elbow, Follow Through). Data analysis used is t-test to see significant differences between before and after being treated. The results showed a significant increase in the accuracy of free throws of basketball extracurricular students, indicated by the average difference before and after treatment (p-test = 3.7 and post-test = 6.20) and t-test (t-count = -7,319; p = 0.000 <0.05). Thus, the application of shooting exercises using the BEEF method can increase the accuracy of free throws of basketball extracurricular students in SMP Negeri 1 Cicalengka.

Keyword: BEEF Method, Free-Throw, Basketball Skill, Physical Education; Extracurricular Sports.

Address Correspondence: STKIP Pasundan

*Email: venyjuniardi@gmail.com

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INTRODUCTION

Sport plays a fundamental role in human development, not only as a medium for physical fitness but also as an instrument for fostering psychological resilience, discipline, and social values. In contemporary educational contexts, sport is increasingly recognized as a strategic component in character building and holistic development, particularly among adolescents. Physical activity conducted systematically and purposefully contributes to physical, mental, and social growth, thereby supporting educational objectives beyond mere motor performance (Ali & Yanto, 2022; Adolph, 2024). Consequently, sports-based learning environments especially those implemented in schools serve as an essential platform for nurturing lifelong healthy behaviors and achievement-oriented mindsets.

Within school settings, extracurricular sports programs play a critical role in complementing formal physical education lessons. These programs provide students with extended opportunities to refine sport-specific skills, experience structured training environments, and engage in competitive situations. Basketball is one of the most popular sports integrated into school extracurricular activities, particularly due to its dynamic nature, high student interest, and adaptability to various levels of skill development (Cahya & Pradipta, 2021). As a team sport requiring coordination, decision-making, and technical proficiency, basketball presents a valuable pedagogical medium for developing both physical competence and cognitive engagement. From a technical perspective, basketball performance is largely determined by the mastery of fundamental skills, including dribbling, passing, and shooting. Among these, shooting is the most decisive skill, as it directly determines scoring outcomes. Regardless of tactical superiority or defensive strength, a team's success ultimately depends on its ability to convert scoring opportunities. In this context, the free throw represents a unique and crucial component of basketball performance. Unlike dynamic shooting situations, free throws are executed in a controlled environment without defensive pressure, placing greater emphasis on individual technique, concentration, and motor control (Kurniadi & Sovensi, 2021; Putri et al., 2021).

Despite its seemingly simple execution, free throw shooting remains a challenging skill, particularly for young or developing players. Empirical observations in school-based basketball programs indicate that students often struggle with consistency and accuracy when performing free throws. These difficulties are frequently associated with improper body balance, lack of visual focus, incorrect elbow alignment, and ineffective follow-through movements. Such technical deficiencies suggest that free throw performance is not merely a matter of repetition but requires structured technical guidance grounded in biomechanical and motor learning principles (Pratomo & Gumantan, 2021). To address these challenges, various instructional approaches and training methods have been developed to improve shooting accuracy. One widely recognized approach is the BEEF method, which emphasizes four key components of effective shooting mechanics: Balance, Eyes, Elbow, and Follow-Through. This method provides a simple yet systematic framework that enables learners to understand and internalize correct shooting techniques. By focusing on body stability, visual concentration, arm alignment, and completion of movement, the BEEF method aligns closely with fundamental principles of motor control and skill acquisition (Ramadhan & Irawan, 2022).

Balance serves as the foundation of shooting accuracy, as stable body positioning allows for efficient force transfer from the lower limbs to the upper body. Proper balance minimizes unnecessary body movement and enhances shot consistency. Visual focus, represented by the "Eyes" component, plays a critical role in target accuracy. Maintaining consistent visual fixation on the rim enables the shooter to calibrate force and direction more effectively. Elbow alignment ensures that the shooting arm follows a straight trajectory toward the target, reducing lateral deviations. Finally, follow-through movement ensures smooth energy release and optimal ball trajectory, contributing to improved shot arc and backspin (Okki Gennio et al., 2020; Ramadhan & Irawan, 2022).

Previous studies have reported positive effects of the BEEF method on shooting performance in basketball. For instance, Meirizal et al. (2022) demonstrated that structured BEEF-based training significantly improved free throw accuracy among student-athletes. Similarly, Alamsyah et al. (2022) found that emphasizing BEEF components enhanced shooting

consistency in extracurricular basketball participants. These findings suggest that the BEEF method is not only practical but also pedagogically effective, particularly for novice and intermediate players.

However, despite growing evidence supporting the effectiveness of the BEEF method, several limitations remain in the existing literature. First, many studies focus predominantly on performance outcomes (product measures) without adequately assessing the quality of movement processes underlying shooting execution. Evaluating both process and product outcomes is essential to understanding whether performance improvements result from genuine technical enhancement or merely short-term adaptation. Second, there is limited empirical evidence specifically examining the application of the BEEF method within junior high school extracurricular settings, particularly in the Indonesian educational context. Given developmental differences in motor learning and coordination among adolescents, findings from older or more advanced populations may not be directly transferable. Furthermore, school-based extracurricular programs often face practical constraints, such as limited training duration and heterogeneous skill levels among participants. Therefore, it is necessary to examine whether a structured yet simple method like BEEF can produce meaningful improvements within realistic training schedules. Addressing this gap is important for physical education teachers and coaches seeking evidence-based training approaches that are both effective and feasible in school environments.

Based on these considerations, this study aims to investigate the effect of shooting exercises using the BEEF method on free throw accuracy among basketball extracurricular students at SMP Negeri 1 Cicalengka. By employing a one-group pretest-posttest experimental design, this study evaluates changes in both shooting performance (free throw accuracy) and movement execution quality following a structured BEEF-based training program. The findings of this study are expected to contribute to the existing body of knowledge by providing empirical evidence on the effectiveness of the BEEF method in improving free throw performance among youth basketball players, as well as offering practical implications for physical education instruction and extracurricular coaching practices.

METHOD

This study employed a quantitative experimental approach using a one-group pretest-posttest design. This design was selected to examine the effect of the BEEF (Balance, Eyes, Elbow, Follow-Through) shooting method on students' free-throw accuracy by comparing performance outcomes before and after the intervention. The population consisted of students who actively participated in the basketball extracurricular program at SMP Negeri 1 Cicalengka during the 2024/2025 academic year. A total of 14 students were selected as research participants using purposive sampling, based on the following criteria: (1) active participation in regular extracurricular training, (2) basic experience in basketball shooting, and (3) consistent attendance throughout the training program. The intervention consisted of a structured shooting training program based on the BEEF method, emphasizing four key components: balance, visual focus, elbow alignment, and follow-through. The program was conducted over 14 training sessions, with a frequency of three sessions per week, and took place at the Oniba Center basketball court. Each session focused on reinforcing correct shooting mechanics through repetitive drills and technical feedback aligned with the BEEF principles.

Data were collected using two types of instruments. Free-throw shooting test (product assessment), in which participants performed 10 free-throw attempts, with successful shots recorded as the performance score, and movement process assessment, evaluating shooting mechanics based on the BEEF components. Measurements were administered twice: before the intervention (pretest) and after the completion of the training program (posttest). Instrument validity was examined using Pearson product-moment correlation, while reliability was assessed using Cronbach's Alpha. The results indicated that all measurement instruments demonstrated high validity and strong internal consistency, confirming their suitability for data collection. Prior to hypothesis testing, the data were analyzed for normality and homogeneity to ensure compliance with parametric test assumptions. Differences between pretest and posttest scores

were analyzed using a paired sample t-test, with a significance level set at $p < 0.05$. All statistical analyses were conducted to determine the effectiveness of the BEEF method in improving free-throw accuracy and shooting mechanics.

RESULT

This study examined the effect of shooting exercises using the BEEF method on free-throw accuracy and shooting movement quality among basketball extracurricular students. Data were collected through pretest and posttest measurements following a structured training intervention consisting of 14 sessions. Descriptive statistical analysis was conducted to summarize participants' performance on both the movement process assessment and the free-throw shooting test.

Table 1. Descriptive Statistics of Pretest and Posttest Scores

	Descriptive Statistics				
	N	Minimum	Maximum	Mean	Std. Deviation
Process_Pretest	14	4	9	7,30	1,331
Process_Posttest	14	7	11	9,50	1,231
Product_Pretest	14	3	5	4,70	,549
Product_Posttest	14	5	9	7,20	1,151

The results show an increase in mean scores for both assessed variables after the intervention. The mean movement process score increased from 7.30 in the pretest to 9.50 in the posttest. Similarly, the mean free-throw accuracy score increased from 4.70 to 7.20 following the training program. Prior to hypothesis testing, data were examined to ensure compliance with parameter test assumptions. Normality and homogeneity tests indicated that all pretest and posttest data were normally distributed and homogeneous, allowing for further analysis using parametric statistical procedures.

To determine whether the observed differences between pretest and posttest scores were statistically significant, a paired sample t-test was conducted for both movement process and free-throw accuracy variables. The results are summarized in Table 2.

Table 2. Paired Sample t-Test Results

Variable Pair	Mean Difference	t-value	Sig. (p)
Process (Pre-Post)	-2.30	-7.319	0.000
Product (Pre-Post)	-2.50	-7.319	0.000

The analysis revealed a statistically significant difference between pretest and posttest scores for both variables ($p < 0.05$). These results indicate that the shooting training program based on the BEEF method produced a significant improvement in movement execution quality and free-throw accuracy among participants. Overall, the results demonstrate that participants showed measurable improvements in both shooting mechanics and free-throw performance following the BEEF-based training intervention. The increase in posttest mean scores and the statistically significant t-test results confirm the effectiveness of the intervention within the observed sample.

DISCUSSION

The findings of the present study indicate that the application of shooting exercises using the BEEF (Balance, Eyes, Elbow, Follow-Through) method significantly improved both free-throw accuracy and shooting movement quality among junior high school basketball extracurricular students. The simultaneous improvement in process and product outcomes suggests that the observed performance gains were supported by meaningful enhancements in shooting mechanics rather than short-term or incidental effects.

From a motor learning perspective, improvements in movement process scores reflect the development of more stable and efficient motor patterns. Skill acquisition theory emphasizes that

structured technical cues facilitate attentional focus on key movement components, thereby accelerating the transition from conscious control to more automatic execution (Schmidt et al., 2019). The BEEF method provides concise and easily remembered cues that guide learners toward optimal shooting mechanics, making it particularly suitable for adolescent athletes who are still developing coordination and perceptual-motor integration. The significant improvement observed in the balance component underscores the importance of postural stability in basketball shooting. Balance plays a foundational role in force generation and transfer, allowing energy produced by the lower limbs to be transmitted effectively to the upper body and the ball. Previous biomechanical studies have demonstrated that stable lower-body positioning contributes to greater shooting consistency and reduced movement variability (Button et al., 2020; Okazaki et al., 2015). The repeated emphasis on balance during the training program likely enabled participants to internalize correct stance and body alignment, leading to improved shooting control.

Visual focus, represented by the "Eyes" component of the BEEF method, is another critical factor influencing shooting accuracy. Research in perceptual-motor behavior highlights that consistent visual fixation on the target enhances movement precision by improving spatial estimation and force regulation (Vickers, 2016). In free-throw situations, where environmental conditions are stable, visual attention becomes a dominant determinant of accuracy. The improvement in free-throw scores observed in this study suggests that training participants to maintain focused visual attention on the rim contributed to more precise shot execution. Elbow alignment is closely associated with shot direction and ball trajectory. Proper alignment of the shooting elbow beneath the ball ensures a linear movement path toward the basket, minimizing lateral deviation. Previous studies have reported that incorrect elbow positioning is one of the most common technical errors among novice and youth basketball players (Satti et al., 2021). By explicitly addressing elbow positioning, the BEEF method likely helped participants correct these errors, resulting in more consistent and accurate shots.

The follow-through component further reinforces shooting effectiveness by ensuring smooth energy release and optimal ball trajectory. Follow-through has been linked to appropriate shot arc and backspin, both of which increase the likelihood of successful free throws (Okazaki & Rodacki, 2012). The observed improvements in posttest scores indicate that participants were able to integrate follow-through movements more effectively, transforming deliberate technical actions into more fluent and automatic motor responses. The significant improvement in free-throw accuracy aligns with previous empirical findings supporting the effectiveness of the BEEF method. Meirizal et al. (2022) reported that BEEF-based training significantly enhanced free-throw shooting performance among student-athletes, while Ramadhan and Irawan (2022) demonstrated that the method effectively improved shooting mechanics in basketball learners. The present study extends these findings by confirming that similar benefits can be achieved within a junior high school extracurricular setting and by incorporating both process- and product-based assessments.

Despite these positive outcomes, several limitations must be acknowledged. The use of a one-group pretest-posttest design without a control group limits causal inference, improvements may partially reflect maturation or repeated testing effects. Additionally, the relatively small sample size restricts the generalizability of the findings. Future studies employing randomized controlled designs and larger samples are recommended to strengthen the evidence base. Longitudinal research is also needed to examine the retention of shooting improvements over time.

Nevertheless, the findings offer important practical implications for physical education teachers and school-based coaches. The BEEF method represents a simple, structured, and time-efficient instructional approach that can be readily implemented in extracurricular programs. Its emphasis on fundamental movement principles aligns well with pedagogical models that prioritize skill development through clear technical feedback. As such, the BEEF method can serve as an effective foundation for teaching shooting skills to youth basketball players in educational contexts.

CONCLUSION

This study demonstrates that the implementation of shooting exercises using the BEEF (Balance, Eyes, Elbow, Follow-Through) method effectively improves free-throw accuracy and shooting movement quality among junior high school basketball extracurricular students. The significant increases observed in both process-based (movement execution) and product-based (free-throw accuracy) outcomes indicate that the BEEF method facilitates meaningful technical improvements rather than merely short-term performance gains.

The findings highlight that structured technical cues focusing on body balance, visual attention, elbow alignment, and follow-through can enhance motor coordination and shooting consistency in youth basketball players. These results support the application of the BEEF method as an instructional approach that aligns with fundamental principles of motor learning and skill acquisition, particularly within school-based training environments. Despite the positive outcomes, the study is limited by the absence of a control group and a relatively small sample size, which may restrict the generalizability of the findings. Future research is recommended to employ randomized controlled designs, larger participant groups, and longitudinal approaches to examine the long-term retention of shooting improvements.

Overall, the BEEF method offers a practical, efficient, and pedagogically sound strategy for physical education teachers and coaches seeking to improve free-throw performance in youth basketball. Its simplicity and effectiveness make it particularly suitable for extracurricular programs with limited training time, contributing to the development of fundamental shooting skills in adolescent learners.

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