

# IMPROVING THE PERFORMANCE OF 3×3 BASKETBALL GAMES IN THE OPPONENT'S PASS WITH THE NON-DOMINANT HAND

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## ABSTRACT

The aim of the study is to study and analyze the effectiveness of the 3×3 players' left-hand (non-dominant hand) outplay and to test its effectiveness.

Research methods – pedagogical observation, experiment and survey methods. This study used a pedagogical observation and experiment to see how special exercises for the left (non-dominant) hand improve the effectiveness of the hoop and the pass. To verify the hypothesis of the study, the authors conducted a survey, semi-structured interview with (n-2) 3×3 basketball coaches, (n-8) male 3×3 basketball players aged between 20 and 37 years and two expert coaches participated in the study.

The study found that the nature of the physiological effects of the exercises used to train basketball players varied significantly. The specific conditioning exercises in 3×3 basketball depend on the combination of physical activities – the type of exercises used, their intensity and duration, the number of rest breaks and the number of repetitions. The authors of the paper developed four exercises (Focus on the left hand; Passing “in one movement”; Passing “with a pause” and Passing “with several movements”) for training the left hand (non-dominant hand) of 3×3 basketball players in order to improve their efficiency and effectiveness.

Comparing the results of testing the athletes before and after the experiment, the authors concluded that the outplay performance to the left with the left (non-dominant) hand right-handed athletes improved by 2.03% after 6 months of training with the developed exercises.

**Keywords:** 3×3 basketball, left side, non-dominant hand, outplay, results, walkthrough.

## Introduction

3×3 basketball is a new form of basketball, with a relatively recent history in the USA (Snoj, 2021). From the bustling streets of America to the Olympics, 3×3 basketball has come into the spotlight at a staggering speed, just like the pace of the game.

Professors at the Third World Conference on Learning, Teaching and Educational Leadership have suggested that professionally accurate and masterful opponent handling

and passing in 3×3 basketball is one of the most important aspects in achieving and improving performance (Ghiteșcu, Moanta & Tudor, 2013). As several researchers have emphasized, reaching the goal efficiently depends on a masterful handling of the opponent, and only then comes putting the ball in the basket and scoring (Gomez et al., 2017).

The topic is relevant in this sport because improving the performance in 3×3 basketball is something everyone wants and will need continuously, for any team. Based on the analyzed scientific studies on improving the finishing, efficiency and effectiveness of the left hand in 3×3 basketball (Bonev & Petrov, 2020; Lenoir, et al., 2012; Perez Fernandez, 2023; Rasulovna, 2022), it can be concluded that the use of the dominant and non-dominant hand is not sufficiently appreciated and given importance. The non-dominant hand is not sufficiently trained, whereas the analysis of the scientific literature allows concluding that it would be of great benefit to both the players and the team as a whole. This technique significantly improves the performance efficiency and effectiveness, thus training the non-dominant hand is relevant to improve the performance in 3×3 basketball.

In 3×3 basketball, professional athletes are able to shoot the ball into the basket from the bottom with both the right and left hand. Therefore, the main and most important element of the game is to outplay the opponent in order to get to the bottom of the basket. Some evidence on the advantages of left-handers suggests that familiarity with left-handed techniques and tactical strategies can disadvantage right-handed players, and that the outcome of left-handed actions can be predicted with significantly lower accuracy compared to right-handed actions (Gualdi et al., 2019).

Analyzing the available research literature and papers, the authors conclude that there are different methods of tackling the opponent; however, tackling the opponent with the non-dominant hand can contribute to improving the performance. An effective way to improve the technique is to develop exercises and practice them in training. These exercises allow coaches and athletes to improve rationally and efficiently in the long term, with the aim of training skilled and professional 3×3 basketball players (Blavt et al., 2020).

## Methodology

The aim of the study was to explore, analyze and test (experiment) the effectiveness of the left-hand (non-dominant hand) overhand pass in 3×3 basketball players.

The study used a mixed research method. It combined quantitative and qualitative research methods; conducting a pedagogical experiment involving (n-8) professional basketball players, males aged from 20 to 37 years, four training exercises developed by the authors of the study over a 6-month (10.03.2023–31.05.2023, 10.09.2023) period to obtain data on the effectiveness of the application of the exercises. Pedagogical observation of athletes was conducted in order to obtain data on the initial performance indicators of the athletes involved in the experiment. The observation allowed analyzing the social world from the perspective of an outside observer. In contrast to observation in everyday settings, exploratory observation is more focused and systematic (Geske & Grinfelds, 2020). The authors conducted semi-structured focus group interviews

with (n-2) experts to obtain expert opinions on the conducted research. There are not many coaches in 3×3 basketball, so Raimonds Feldmanis (RF), head coach of the Latvian men's 3×3 basketball team, and Edijs Šlesers (ES) (former coach of the Latvian youth 3×3 basketball team) were invited, both coaches gave written consent to publish their data. The semi-structured interview with the experts was conducted face-to-face, audio-recorded, followed by text transcription. The interview with the athletes (n-8) was conducted face-to-face, with the authors distributing the developed questionnaires to each athlete involved in the experiment, then summarizing and analyzing the responses and drawing conclusions from the results in line with the aim of the present study. The mathematical and statistical analysis of the experimental results was summarized in the table.

The survey was carried out using questionnaires and data collection methods. Research ethics principles (Geske & Grīnfelds, 2020) were applied in the design and implementation of the study. Participants were briefed on the process of the study, all participants were informed about the anonymity of the data and that the data would be presented only in aggregated form, as well as that if participants did not wish to continue their participation in the study for various reasons, they could stop at any point. Participants acknowledged their participation in the study by signing the form.

Participants. Based on the fact that there are not many professional 3×3 basketball players in Latvia to separate them into experimental and control groups, the experiment was conducted with one experimental group where the method of performance comparison (before and after) was applied. The experimental group initially consisted of (n-10) professional 3×3 basketball players and the experiment was conducted with (n-8) male athletes, aged 20–37 years. Only right-handed players were involved in the experiment, because one of the 10 athletes was left-handed and one player was injured during the experiment, so these two athletes were not included in the experimental group.

The experimental group was given four exercises designed by the authors for training the left (non-dominant) hand. These exercises were in addition to the usual training three times a week in order to observe and compare the effect of these exercises on the athlete's training of the left (non-dominant) arm, when players performed the round-off pass through the left side, whether the performance improved, remained unchanged or deteriorated. As a result, the experimental group was compared by testing and observation methods, comparing the baseline performance before the experiment with the performance at the end of the experiment.

The authors designed exercises for the development of the non-dominant arm and included them in the athletes' training plan 3 times a week:

1. Focus on the left hand:

- Athletes split into pairs and face each other. During the exercise, they alternate;
- The distance is varied;
- The athletes pass the ball to each other with the left hand;
- When receiving the ball, athletes make one or more dribbles with the left hand only, then pass the ball to their partner with the left hand. In addition to this

exercise, when receiving a pass, simultaneously with the left-hand dribble, athletes place the feet in a straddling position to the left.

The athletes shall perform the exercise for 2 minutes.

2. One-way walk:

- The coach or partner passes the ball to the player on the shooting line, on receiving the ball the player simultaneously places his feet in position to pass to the left, until the athlete has received the ball, he passes to the left in a single tap with the left hand.

The exercise shall be performed for 2 minutes.

3. “Pause” pass:

- The coach or partner passes the ball to the player on the shooting line, the player receives the ball while placing his feet in the shooting position, shows a wave that he will shoot, then deftly performs a pass to the left side with one tap with the left hand.

The athletes shall perform the exercise for 2 minutes.

4. “Multi-movement” pass:

- The coach or partner passes the ball to the player just behind the shooting line. The player makes one dribble with the left hand at the same time as the dribble to the left, then makes a dribble with the right hand, transfers the ball to the left hand and makes a through move to the left with one or more dribble taps with the left hand.

The athletes shall perform the exercise for 2 minutes.

Exercise duration was varied between 8 and 10 minutes per workout, 3 times a week.

The choice of exercises was based on the authors’ observation, review of the training plans, exercises and training methods used by the coaches. Based on the theoretical studies (Basketball for Coaches, 2023; Clemente et al., 2019; Gels, 2023), the authors concluded that the passing exercises should be performed with pauses not to overload the non-dominant hand (weaker side), therefore, they should be dosed. In consultation with the team coach, the recommendation for dosage is 2 minutes. The important element is the necessity to vary the exercises, so the authors developed exercises in one movement and with several movements. The rationale for the choice of exercises is to ensure an increase in the load, progressive improvement of technique and sequence of exercises. The sequence of exercises was designed from easiest to most difficult (Davis, 2021). At the very core, the most important base, the improvement of the left (non-dominant) hand training technique, was maintained.

## Results and discussion

To compare the data, analyze the results and draw conclusions the authors used the experiment and testing of professional athletes.

The initial performance of athletes before the experiment served for comparing the data reflecting the initial performance of the left hand (non-dominant hand) of 3×3 basketball players.

The results in Table 1 (1341 out of 1653 passes) show that athletes usually pass with the right hand on the right side, indicating a habitual training technique. The total number of passes also confirms this (1537 out of 1653 passes). As can be seen in percentage terms, the initial figures of 7.02% of the passes were performed on the left with the left hand and 92.98% on the right with the right hand. The authors conclude that the potential of the left hand is underutilized, which could improve performance because of training. The emphasis on the non-dominant hand has also been highlighted by other researchers in their studies, where they stress that the use of the non-dominant hand in basketball is becoming more frequent as the level of players' professional skills increases, while the number of ball contacts with the dominant hand decreases (Stöckel & Weigelt, 2012).

During the research, the experiment was conducted as indicated – four exercises to test the athletes, performed 3 times a week, 8–10 minutes in addition to their training. At the end of the experimental period, after the last workout, the last performance recording and analysis of the total performance results were explored, and the following data were obtained (see Table 1).

**Table 1** Summary of athletes' performance (n-8)

Indicators	Receiving the ball			
	RESULTANT left pass (left-handed)	Non-resultant left pass (left-handed)	RESULTANT right pass (right-handed)	Non-resultant right pass (right-handed)
<b>Indicators (BEFORE experiment)</b>				
Total passes	81	35	1341	196
Total passes	116		1537	
Total	1653			
Passes %	4.90	2.12	81.13	11.86
	7.02		92.98	
Results % specific side	69.83	30.17	87.25	12.75
<b>Indicators (AFTER)</b>				
Total passes	337.00	132.00	2067.00	295.00
Total passes	469		2362	
Total	2831			
Passes %	11.90	4.66	73.01	10.42
	16.57		83.43	
Results % specific side	71.86	28.14	87.51	12.49
<b>BEFORE and AFTER comparison</b>				
Improvement in the performance of passes %	2.03	-2.03	0.26	-0.26
Improvement of the number of passes on the left %	9.55	-	-	-

Comparing the results of testing athletes before and after the experiment, allows concluding that the performance of the left-handed (non-dominant) right-handed over-hand pass improved by 2.03% after 6 months of training with the exercises developed by the authors.

The analyzed data show that initially the athletes had 69.83% efficiency of the left-handed round-off with the left hand, but after the experiment they had 71.86%, which confirms that the efficiency has improved by 2.03%. On the other hand, when analyzing the number of passes on the left side, the data shows an improvement of 9.55% (see Table 1). After analyzing the data, the authors conclude that the results are not statistically significant, but some progress can be observed. It should be noted that in high-performance sport it is difficult to achieve big changes in technical performance. Future studies should investigate a wider range of players, with different skill levels.

Based on the above, the authors conclude that developing specific non-dominant hand exercises can improve the non-dominant hand (the weaker side) of players. After conducting the experiment for 6 months, it can be concluded that the athletes have improved their performance as well as efficiency in passing through the left side with the left hand. Confirmation was also gained from the findings of other researchers. They have emphasized in their work have that the performance in 3×3 basketball games against an opponent can be improved by training both the general physical fitness of the player and by introducing specific nuances in training, such as training the non-dominant hand. The training should be complex and athletes should work more with the non-dominant hand (Perez Fernandez, 2023; Rasulovna, 2022; Bonev & Petrov, 2020).

Researchers from Italy, on the other hand, highlight that training professional-level athletes can change the choice of the dominant hand in basketball elements, especially for players with the highest skill level in certain game situations (Gualdi et al., 2019).

Analyzing athletes' opinions in the questionnaire, the data show that in games and in training, athletes are more likely to pass the ball when they receive it than to shoot immediately at the basket, which in turn suggests that passing the ball is very important. Therefore, finding ways to improve the efficiency and effectiveness of the passing game is key to winning the game.

Athletes have indicated that right-handers are more likely to pass to the right, suggesting that the non-dominant side (left) is worth working on in training to improve their skills.

In addition, the data from the questionnaire confirm that right-handed athletes routinely cover the dominant (right) side rather than the left in their usual playing technique. Consequently, this gives a playing advantage to the opposing player, who is also strong on the left side, or both sides equally strong, creating a situation to make deceptive moves. The opponent becomes unpredictable and thus has a better chance of outplaying the player, which confirms the task, training the left side for passing is essential, which other researchers have underlined in their research, because the level of the non-dominant hand must be trained so that both hands become dominant (Lenoir et al., 2012).

The previous statement is supported by the athletes' opinion on whether improving the left-handed pass to the left improves the athlete's performance, where (n-5) athletes stated that it was important because their opponent covered that side less, while (n-3) athletes stated that it was slightly important. Thus, it confirms that the incorporated exercises improve the athlete's performance. The studies by other authors also confirm the conclusion that a player can attack equally well in both directions, which makes the player dangerous to the opponent. The opposing team has to put more effort into defense because it is not possible to guess which direction and which way the player will pass and tackle. Such players are an asset for every coach in 3×3 basketball. Training the non-dominant hand to pass and shoot gives more chances to score, to get to the bottom of the basket and shoot the ball (Courel-Ibanez, Maimon & Ruiz, 2020).

As to whether a pass to the left can decide the outcome of a match, (n-3) strongly agree and (n-5) strongly agree. Overall, the results of the questionnaire suggest that training the left hand to pass to the left side has improved the athletes' performance in overpowering the opponent, as well as improved the athletes' efficiency and effectiveness. Thus, the authors conclude that the aim of the study has been achieved; training athletes (right-handers) to pass the ball around the left side with the left (non-dominant) hand is an essential and necessary element for improving the performance and efficiency in 3×3 basketball.

To confirm the results of the study, the authors conducted a semi-structured focus group interview with two experts – RF and ES. The questions were structured according to the research question and topicality.

In the survey, both experts stressed the relevance of the topic in today's fast-paced game. Players are more likely to use the elements they know best, to play to their strengths. In stressful situations, players are more likely to choose to perform a solid movement that they have learnt in training. RF: *"The more an athlete trains his weaknesses / technical elements, the more often he will use them and be able to exploit them"*. If players want to be more versatile, better, more efficient, they need to work harder on their left hand.

Asking the experts how training these "weaker elements" can make a difference in the game, both experts point out that sometimes one good shot, one good pass, especially at the highest level, can be enough to make a difference in the game. RF: *"At the decisive moment, when the defender has covered the right side of the attacker with the ball, he will have a better chance and will also be more technically prepared to make a through ball to the left side, which will be less covered at that moment. And then, that can make the difference"*. RF also points out that *"...it is difficult to train a player's "weak technical elements", the ones that work well need to be developed, and the ones that don't work so well at the highest level need to be developed even more"*. The emphasis in training should be on developing the non-dominant side, both in the gym and on the basketball court, gradually, regularly and without overdoing it. The more versatile an athlete is on the court, e.g. using both hands equally well on the dribble, in passing or shooting at the basket, the harder it will be to cover him and the more likely he will score.

The authors of the study wanted to find out whether experts also paid more attention to the non-dominant hand in their practice. Experts admitted that they trained players often and a lot in the weakest technical elements, but there was not enough time for everything, so each player also had to work individually a lot. ES emphasized “...we focus a lot on dribbling with two balls – it develops both coordination and a bit of technique equally for both hands. Also, those athletes who are significantly right-hand dominant use the left-hand dribble, just less than the right (dominant) hand”.

The experts in the authors' study are of the opinion that they have used similar exercises in their training, but not as regularly. The experts believe that it may improve the quality of the game slightly at the beginning, but then the exercises should be gradually refined to develop the left hand. This is also the opinion of Ukrainian researchers on special basketball exercises that can have an immediate effect. The first step in the process of effective training of basketball players is to draw up a plan of special exercises. Special conditioning exercises in 3×3 basketball depend on the combination of physical activities – the type of exercises used, their intensity and duration, the number of rest breaks and the number of repetitions (Blavt et al., 2020).

Based on the opinions of coaches and experts, it can be concluded that the left hand is a tool for right-handed players that has the potential of improving the ability to outplay the opponent and increase the effectiveness of the game.

## Conclusions

The conducted research allows concluding that in 3×3 basketball, coaching and perfecting the opponent's play with the non-dominant hand is one of the most important elements of this game. The level of the non-dominant hand must be trained in such a way that both hands become dominant. The practice of such a technique tends to be more fruitful compared to the usual, where only one hand is dominant. This can be achieved through individually developed systematic training under the supervision of coaches, both in team training and in games. During the experiment, the effectiveness of the play pass on the left side with the right hand of the left (non-dominant) hand, after 6 months of training with the exercises developed by the authors, improved by 2.03%. Improving the pass to the left side with the left hand improved the performance of the athletes. Thus, it can be concluded that the goal of the study has been achieved. The results of the study prove that by developing specific exercises for the left-handed (non-dominant hand) play, pass training, the effectiveness and efficiency of athletes is improved.

## REFERENCES

- Basketball for Coaches (2023). *3-on-3 Basketball Plays to Score Easy Points (5 Plays)*. <https://www.basketballforcoaches.com/3-on-3-basketball-plays/>
- Blavt, O., Doroshenko, E., Koryahin, V., Prystynsky, V., Stadnyk, V. (2020). Training Effect of Special Basketball Exercises. *Teoria ta Metodika Fizičnogo Vihovanna*, 20(3), 137–141. <https://doi.org/10.17309/tmfv.2020.3.02>



- Bonev, M., Petrov, L. (2020). About The Methodology of Preparation of Basketball Players for The Game 3×3 Basketball. *Trakia Journal of Sciences*, 18(1), 679–681. <https://doi:10.15547/tjs.2020.s.01.109>
- Clemente, F. M., Conte, D., Gomez, M.-A., Straigis, E., Tessitore, A. (2019). Performance profile and game-related statistics of FIBA 3×3 Basketball World Cup 2017. *Journal of Sport and Exercise Sciences*. <https://doi.org/10.5114/biolsport.2019.83007>
- Courel-Ibanez, J., Maimon, A. Q., Ruiz, F. J. R. (2020). The Basketball Pass. *PubMed Central Scientific literature library*. <https://doi:10.2478/hukin-2019-0088>; <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7052720/>
- Davis, P. (2021). *How Can You Improve Your Left (Weak) Hand Dribbling on 3vs3*. <https://oneupbasketball.com/how-can-you-improve-your-left-weak-hand-dribbling/>
- Gels, J. A. (2023). *Basketball Plays – 3-on-3 Plays. Coach's Clipboard Basketball Playbook*. <https://www.coachesclipboard.net/3on3Plays.html>
- Geske, A., Grinfelds, A., (2020). *Izglītības pētījumu aptaujas – no izveidošanas līdz datu apstrādei* [Educational research surveys – from creation to data processing]. Latvijas Universitāte, Pedagoģijas, psiholoģijas un mākslas fakultāte. <https://dspace.lu.lv/dspace/handle/7/54441>
- Ghitescu, I. G., Moanta, A. D., Tudor, V. (2013). The methodological overview for the technical-tactical training in basketball. *Proceedings of the 3rd World Conference on Learning, Teaching and Educational Leadership (WCLTA-2012) Procedia – Social and Behavioral Sciences*. [http://tru.uni-sz.bg/tjs/TJS%20-%20Suppl.1,%20Vol.18%202020/109\\_L.Petrov.pdf](http://tru.uni-sz.bg/tjs/TJS%20-%20Suppl.1,%20Vol.18%202020/109_L.Petrov.pdf)
- Gomez, M. A., Navarro, R. M., Ribas, L. R., Tavares, F. (2017). An analysis of the side of rebound in high level basketball games. Retrieved from: *International Journal of Performance Analysis in Sport* <https://doi.org/10.1080/24748668.2011.11868543>
- Gualdi, E., Rinaldo, N., Pasini, A., Zaccagni, L. (2019). Hand Preference and Performance in Basketball Tasks. *International Journal of Environmental Research and Public Health*. <https://www.mdpi.com/1660-4601/16/22/4336>
- Lenoir, M., Musch, E., Philippaerts, R., Tallir, I. B., Valcke, M. (2012). Learning opportunities in 3 on 3 versus 5 on 5 basketball game play: An application of nonlinear pedagogy. *International Journal Sport Psychology*, 43, 420–437. <https://doi.org/10.7352/IJSP.2012.43.420>
- Perez Fernandez, I. B. (2023). 3×3 Physical Training: Periodization. *International Journal of Environmental Research and Public Health*. <https://doi.org/10.13140/RG.2.2.11643.90408>
- Rasulovna, S. N. (2022). The mechanism of improving the primary training methods of basketball sports, training skilled basketball players. *Web of Scientist: International Scientific Research Journal*, 3(2). <https://wos.academiascience.org/index.php/wos/article/view/967/898>
- Snoj, L. (2021). *3×3 Basketball Everything you need to know*. UK: Meyer & Meyer Sport Ltd.
- Stöckel, T., Weigelt, M. (2012). Plasticity of human handedness: Decreased one-hand bias and inter-manual performance asymmetry in expert basketball players. *Journal of Sports Sciences* 30(10), 1037–1045. <https://doi.org/10.1080/02640414.2012.685087>