NEW ASPECTS OF LONG JUMP OFFICIATING: REVIEW OF TAKE-OFF ZONE

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ABSTRACT
Track and field rules are constantly evolving to make the sport fairer, more precise, and easier for officials to make accurate calls without hesitation. In recent years, some rule changes in certain disciplines have been introduced to make athletics more popular, interesting, and engaging for the audience. The latest idea for horizontal jumps, which is currently in a test phase, is linked to the take-off zone.
The study aims to present aspects of the possible implementation of the rule for the take-off zone. The methodology used in this study includes case-study analysis from competition, literature review, interviews, and sport pedagogical analysis. The main objectives are the introduction of the concept and layout of the take-off zone and an analysis of test competitions held in Düsseldorf, which served as a trial for the take-off zone.
According to our data, the average improvement in results from the zone is 0.18m. The highest improvement an athlete achieved was 0.48m, and the lowest was 0.02m. When investigating this potential rule change, we identified several weak points, including the increased time required to process the results of each athlete, the involvement of additional officials, and the need for more equipment.
The conclusion from reviewing the feasibility of this new rule is that it makes the competition more interesting and improves results. However, it requires much more effort, time, and people. Additionally, it could require significant financial resources, which may be a challenge for some federations. It also brings a degree of confusion and discussion among officials, especially in defining the point at which the athlete's feet leave the ground. More precise instructions are still needed.

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INTRODUCTION

Track and field has undergone significant improvements in recent years. Some rule changes are made primarily to increase the sport's popularity and attract more TV viewers. Also in recent years there is an addition to the team of officials witch is the Presentation manager, who often commands the whole "spectactacle" by saying for the program to slow down or hurry up, or for athletes to wait an additional time, although that by rules in field events they have time allowed for trial, just for the athlete to be streamed on tv. Additionally, officials have a time limit to complete the round or the entire discipline, which can lead to increased stress. However, most of the changes are made to create an engaging overall experience of the competition. Modifying the rules is a common way to change the sport conditions. Rules provide the unique, differentiating character to the sport (Arias et al., 2011)
The long jump is one of the most popular disciplines in track and field. A significant part of the addition competitions is part of the European athletics continental tour, and the higher levels of World Athletics (WA) have these disciplines in their programs. For the long jump, one of the most important parts is the take-off. After take-off, the athlete can't do much, and regardless of the style used, scissors, hang, or hitch-hang, they only need to maintain balance and land correctly according to the rules. The take-off is the moment of truth and requires speed, perfect control, power, and technique. The successful take-off leads to the measurement of the trial. However, it is not always easy for judges to determine whether an attempt is valid or not. There are whole sections in the rule book for that, which sometimes create a lot of confusion, due to different people's interpretations. Some of the old rules stated that if the lace of the shoe crosses the vertical plane of the take-off lane, the attempt is not valid.
Before 2021, only plasticine boards were standard, but they were often imprecise. The plasticine is 45 degrees angled, and most contacts use subtle imprints, indicating the foul. However, sometimes there were significant toe-breaks that could not be detected, leading to numerous discussions about the validity of certain attempts, especial-

ly in high-level competitions, and leaving judges with difficult tasks. This led to the wooden boards, which are now mainly used, because the Chief Judge can have a clearer foul decision (Bulgarian Athletic Federation, 2023). For the wooden boards, judges use the help of technology (special high-speed cameras with many frames per second). For the athlete to make a valid trial/they should not break the vertical plane of the take-off line with any part of the shoe or foot. The team of officials needed some time to adjust to this transition phase. And just when things started to settle, a new rule change emerged on the horizon. It is common for high-level competitions that 1/3 of the athletes make jumps that are fouls (Abhiruchi, 2024); therefore, WA decided to take some actions and proceed with an experimental phase of a "take-off zone". The idea is to increase the valid trials, which will draw even more attention to the horizontal jumps. Additionally, the entire competition should be more continuous and uninterrupted. WA gathered extensive data from research and development programs prior to the test competitions, as this structured process (Figure 1) can help introduce and refine new ideas in athletics (WA, 2025). Additionally, according to Arias (2011), modifications in a sport should be analyzed through a reflective process before they are finally introduced.

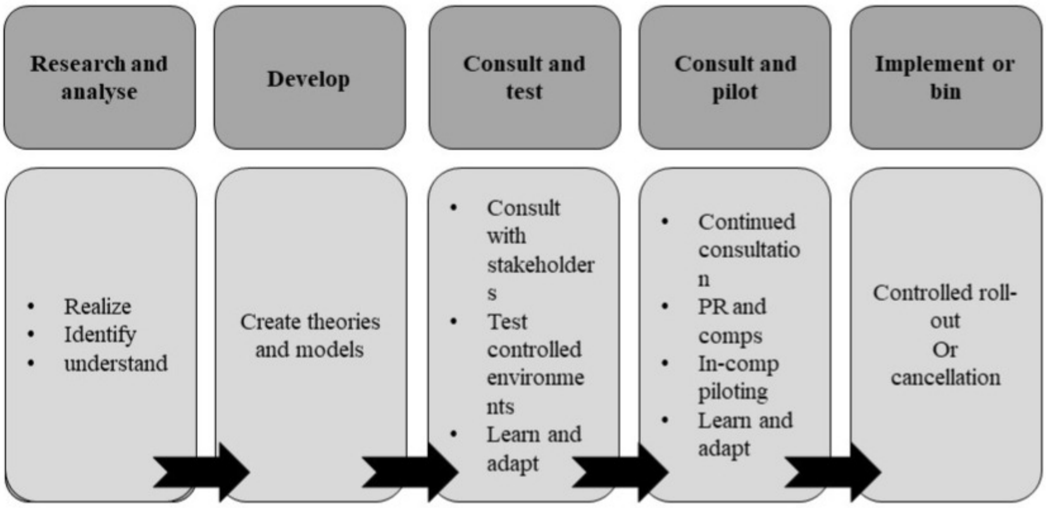

Figure 1. *WA innovation system*

With TOZ, athletes will get a bigger area to launch themselves, and the distance from there to where the athletes land in the pit will be considered as the length of the jump, compared to the traditional wooden take-off board, where athletes must take off without touching the line for the jump to be considered valid (Abhiruchi, 2024). The long jump is one of the most challenging disciplines, especially when it comes to the accuracy of the run-up in relation to the take-off board. With the introduction of this innovation, even less technically skilled but physically strong athletes will have the opportunity to achieve good results (Ewing, 2025; TNT,2025). This could shift the competitive balance and make the discipline more accessible to a wider range of athletes.

Aim and Objectives

The aim of the study is to present aspects of the possible implementation of the rule for horizontal jumps.

The main objectives of the study are:

To introduce the take-off zone for horizontal jumps.

To reflect upon the possibility of the new rule implementation and consequences — whether positive or negative — from a sports pedagogical perspective.

To analyze the test competition and compare the athlete's results achieved and measured by the new method.

METHODOLOGY

The methodology employed in this study comprises case study analysis from test competitions, a literature review, interviews, and sport pedagogical analysis. We present the concept of Take-off zone (TOZ), its layout, and some key points and specifics. The interviews were conducted informally with 10 coaches and 11 international officials. These conversations were not structured but aimed to capture their views possibility of the rule modifications. All respondents were briefed, and informed consent was taken.

From the test competition, we analyzed the validity of results once according to the TOZ and second according to the WA current rules. As the test competition was invitational, only seven athletes participated, resulting in a small sample size. We estimated the percentage of overall validity of performance and the validity of each individual athlete. We estimated the mean overall and individual improvements in the athletes' sporting results.

The two meetings where the test competition in the long jump took place were in Düsseldorf and Berlin. Setting up the TOZ at the two competitions was essentially the same, with minor differences, such as a more visible indication of the take-off line, which would typically be (according to WA rules) at Berlin, but ultimately did not significantly alter the results. In Düsseldorf, there were only two red circles on the sides of the board, and in Berlin, there was a blue rectangle to indicate the zero lane. These types of indicators enabled the athletes and their coaches to estimate the right spot to jump off to produce a valid result (Webinar Series, EA,2025).

During the competition, there were two ways of collecting the results of the long jumpers. One was from the TOZ, which were the results published in the arena, and these were used for the ranking and for determining the winner. And in the background, there was a shadow results list, which was determined according to the current WA rules for horizontal jumps. To determine this, athletes were not supposed to hit an invisible take-off line, which in normal conditions would have been marked by a board with a contrasting color to indicate the exact spot of the take-off line. For this purpose, on the video control, there was also a line added from the program on the image for estimating this.

Visualization of the take-off zone from the test events is shown in Figure 2. In the competition in Düsseldorf, the take-off line was indicated by two red dots on either side of the board, but according to competitors, it was not indicative enough. For that reason, on the next test event in Munich, the indication was made with a blue rectangle, which gives more visibility of the take-off line. But even with this kind of indication, the validity of the results remained almost unchanged.

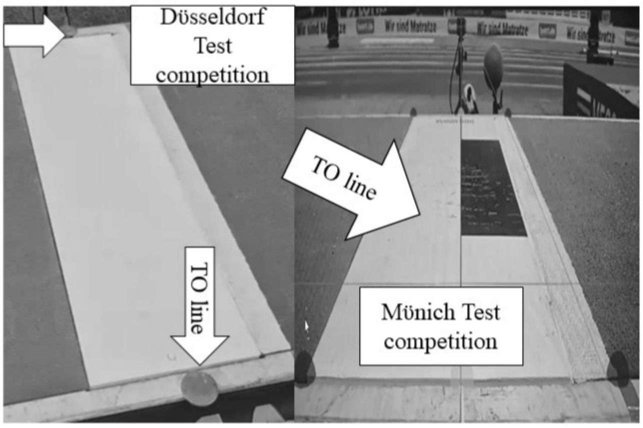

Figure 2. *Visualization of the take-off zone from the test events (Photo retrieved from the EA webinar series)*

The layout of the cameras is considered to be classic. There is one camera used for a valid take-off from the TOZ and also for a valid take-off according to WA rules. Also, with the help of this camera, the measurement from the take-off place to the zero line (A measurement, Figure 3). The other set of cameras is located in the stance, which is observing the landing pit and taking the measurement from the mark to the zero line (B measurement). The combined result is calculated as the sum of A and B.

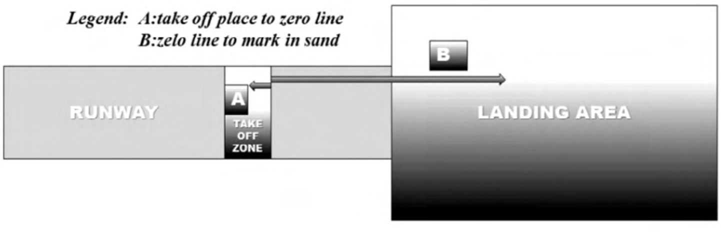

Figure 3. *Measurements from EDM/VDM*

RESULTS

According to comments from officials, participating in the test competition, there have been some cases that were difficult to estimate whether the trial is valid or not, because the foot is positioned at the end of the zone. This was due to the positioning of the camera, which is at the center of the board. When the foot of the athlete is around the center of the take-off board, there were no problems, but when the foot is at the far end, it was quite complicated to tell whether the takeoff was valid or not. There were proposals to add one more camera at the TOZ to capture an appropriate angle, particularly attempts closer to the take-off line. However, this requires additional equipment and time for installation and synchronization, as well as more room for error or malfunction. More VDM or EDM systems would require more time for installation. And more people. The more complicated the process, the more room for error.

If we leave all the equipment apart and the complex process of laying out cameras and calculating results, the main issue is still determining the take-off point. Officials take what is logical to use as the real point from where the athletes jump off is the tip of the shoe. However, each shoe itself and every model has a different configuration. Also, at what moment to freeze the frame of the camera, because different angles of separation can also impact this point and change whether the result is valid. There are too many instances from practice that show differences and subjectivity during the decision. Some judges declare the attempt invalid even for a few pixels, on a screen with low resolution. This leads to a lot of discussions and sometimes forgetting that if the official is not sure better to judge in favor of the athlete. But validating an attempt that is a very close call to an invalid one can affect other athletes, and in this case is not in their favor, so a lot of questions are still arising. Implementing the rule for TOZ seems to be questionable from the beginning, and despite the positive impact on the athletes' performances, there are still too many comments from non-supporters.

The data presented in the following table indicates the results achieved by the athletes with measurements from TOZ and measurements from the line. It is obvious that the ranking of the athletes is different, depending on the type of measurement. Because it is a test competition, it was previously declared that the official ranking will be based on measurements from TOZ. Athletes had considerable benefits, such as improvement not only in results but also in ranking position. Also, one athlete managed to make up to 4th place, compared to current WA rules, she wouldn't even be on the rank because she made all 6 attempts invalid, leading to no measured results. According to the data, each athlete makes 3 failed attempts less, which really makes the competition more ongoing, which is the main purpose behind the implementation of the new officiating rule.

Table 1. *Results(m) and ranking of the athletes*

				LJ TOZ				
RANK		1	2	3	4	5	6	**result**
1	MIHAMBO M.	6.37	6.61	6.50	6.87	6.80	-	**6.87**
2	HONDEMA P.	6.68	6.60	6.66	6.59	6.55	6.53	**6.68**
3	MITKOVA P.	6.47	6.43	x	x	6.67	6.54	**6.67**
4	HOROWSKA N.	6.49	x	6.23	6.32	6.37	6.54	**6.54**
5	MATUSZEWICZ A.	6.53	6.15	6.40	6.46	6.18	6.39	**6.53**
6	ATTERMEYER S.	6.29	5.97	x	5.95	6.30	x	**6.30**
7	KLEIN C.	6.13	6.30	6.19	6.08	5.91	6.18	**6.30**
				LJ current WA Rules				
1	HONDEMA P.	6.56	x	6.65	6.56	6.55	x	**6.65**
2	MATUSZEWICZ A.	x	x	6.40	x	6.11	x	**6.40**
3	MIHAMBO M.	x	x	6.39	x	x	-	**6.39**
4	MITKOVA P.	x	x	x	x	x	6.34	**6.34**
5	ATTERMEYER S.	6.09	5.77	x	x	6.28	x	**6.28**
6	KLEIN C.	x	6.22	x	x	x	x	**6.22**
-	HOROWSKA N.	x	x	x	x	x	x	**NM**

Table 2. *Percentage validity of attempts depending on the officiating rule applied.*

	number of fails TOZ	number of fails LINE	DIFFERENCE	TOZ	LINE
MIHAMBO M.	0	4	4	100%	34%
HONDEMA P.	0	2	2	100%	67%
MITKOVA P.	2	5	3	67%	17%
HOROWSKA N.	1	6	5	83%	0%
MATUSZEWICZ A.	0	4	4	100%	34%
ATTERMEYER S.	2	3	1	67%	50%
KLEIN C.	0	5	5	100%	17%

The overall validity of attempts from the line (current WA rule) is 31% and from TOZ, the validity increased to 88%. The table represents the percentage validity for each separate athlete and the improvement of each separate attempt in cm.
Taking all attempts from TOZ together, we established that the maximum improvement of an athlete is 48 cm, the minimum is 2 cm, and the mean value is 18 cm. The table also shows the improvement of each attempt, related to the result measured according current rule. Mitkova and Attermeyer have one of the largest improvements, exceeding 0.20 m.

Table 3. *Improvement of the result (m) depending on the officiating rule applied.*

	1	2	3	4	5	6	IMPROVEMENT (m)	RESULT (m)	
								TOZ	LINE
MIHAMBO M.			0.11				**0.48**	6.87	6.39
HONDEMA P.	0.09		0.01	0.03	0		**0.03**	6.68	6.65
MITKOVA P.						0.20	**0.33**	6.67	6.34
HOROWSKA N.							-	6.54	NM
MATUSZEWICZ A.			0		0.07		**0.13**	6.53	6.40
ATTERMEYER S.	0.20	0.25			0.02		**0.20**	6.30	6.28
KLEIN C.		0.08					**0.80**	6.30	6.22

DISCUSSION

The test events for the take-off zone had a huge impact on the track and field society and produced a lot of discussions. There is no doubt that the competitions held the interest of the audience and the press, but many concerns emerged upon implementing the TOZ. The whole process of measuring results is more complex, involving more people, more techniques, and inevitably more time. Depending on two separate Electronic Distance Measurement (EDM) and Video Distance Measurement (VDM) systems, or making two different measurements for one attempt, and then calculating the ultimate results, is time and cost-effective. However, the main concerns are determining the right take-off point and the moment during the separation between the take-off leg and the ground. When officiating in the take-off zone, estimating the point can be subjective, and two separate officials can determine two different points. There is a great need to establish a unified criterion if WA wants this rule to be applied. More test competitions are upcoming in the future.

CONLCUSION

The TOZ presents advantages and notable changes for athletes. The demonstration of a significant increase in the validity of results, rising from 31 to 88 %, accompanied by measurable improvements in performance, suggests that TOZ may encourage more dynamic and engaging competitions. However, incorporating a more complex measurement process and the lack of clear and standardized protocols present a grave obstacle for technical officials in determining the take-off point due to subjectivity.
The data we presented shows some limitations due to the small sample size. The results are preliminary, and for it to be generalized, we need further test competitions with broader groups. This way, we could provide stronger datasets and help show whether performance outcomes are consistent and reliable. The insights from the informal interviews with coaches and referees should be interpreted as illustrative rather than generalizable.

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