

Optimization of learning content of speed running in physical education lessons.

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Abstract

This study aims to determine the elements of gesture learning that further promote the improvement of speed performance among pupils aged between 16 and 18 years old, this research was carried out with secondary school pupils "MOUHAMED BOUDIAF Tazmalt" using an 80 m speed-running test.

To properly address this issue, we followed an experimental approach translated by a pre-test and post-test; The results obtained show the existence of differences in the results of the second test compared to the first, and the existence of a correlation between the improvement of speed performance and gesture learning among secondary school pupils. And this is what confirms our hypotheses.

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1. Introduction

According to (Parlebas, 1981), physical education and sports is an activity that influences the motor behaviors of pupils, consistent with implicit or explicit educational standards. Among the qualities focused on by PSE, we find speed characterized as the ability to perform motor actions in a least time. It is a complex quality broken down into three central constituents

Reaction speed (Speed of reacting to something from outside.)

Gestural speed (quickness of simple actions e.g. throwing), and gestural frequency (cadenced repetition of an action e.g. locomotion), this quality depends on several factors: energy reserves within the shape of ATP-CP (A Saih and al, 2024), warm-up state, tiredness, improvement of strength and the rate of fast fibers. Sprint running is one of the most frequently practiced activities in schools, for several considerations:

It is strongly recommended in school curricula. (Ministry of National Education, 2003) and it is given capital importance, given its contribution to the development of the pupils' gesture reservoir.

It is a physical quality that correlates with other qualities such as endurance speed and strength speed (Boutaghane M, & all, 2024).

Likewise, it provides a remedying for psychomotor overlaps, and disturbances caused by teenage (Pineau, J. C, 1991).

Finally, it is not costly in terms of space and didactic means. All that is required is a space of 80 m in length, and 2 m in width (at least). It should also be noted its usefulness, and convenience for all collective disciplines as indicated by (Sbaa Ch, Mezari F, 2023).

However, the follow-up of pupils' performances appears a clear improvement. Although these are only short lessons, of around 50 min at a rate of 5 to 7 lessons max, According to the principles of the sports training methodology, this volume is considered insufficient to obtain any improvement in physical fitness. Therefore, the only explanation for the improvement in performance is the impact of motor learning. From this standpoint, the following questions can be raised:

- Is there a correlation between performance improvement and other elements of the discipline? In other words, what leads to improving pupils performances?

- **Research hypotheses:**
- **General hypotheses:**
 - There is a correlation between improved speed performance and gesture learning of pupils in secondary schools.
- **Partial hypotheses**
 - All technical elements improve significantly after a speed cycle in the PSE context.
 - An improvement in performance results from the improvement of technical elements, with different contributions.
- **General objective of the study:**

This study aims to determine the elements and contents (learning units) that promote the development of pupils ' speed performance in physical education and sports (PSE), taking into account their individual characteristics. The results will help optimize speed running teaching programs of secondary schools.

I. Followed Methodologies:

2.1. Procedural definition:

- **Optimisation**

Determine the optimal time frame for each element to get as close as possible to the best result.

- **Gesture learning**

Includes acquiring motor skills associated to speed racing activity.

- **Speed performance**

The time taken to cover the specified distance, or speed timing.

2.2. The methodological procedures used in the study:

2.2.1. Method and tools:

Choosing a research methodology is directly linked to the research subject, which allows us to verify the existence of a correlation between speed performance and motor learning scores. During our study, we used the experimental method defined as a scientific approach that consists of testing the validity or invalidity of a hypothesis through repeated tests.

To optimize the education content, it is required to identify which ones have the greatest effect on the progress of speed performance. Therefore, the study tasks are:

Starting with a pre-test, which allows determining the speed timing, and scores of the different gesture techniques before starting the learning unit.

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In the second step, the group's teacher applied the content of the learning unit prescribed within the official curriculum.(Ministry of National Education b, 2003).

Finally realize a post-test and measure the same elements as those initially measured before the learning sequence.

All these tasks aims to assess the progress of speed racing performance, as well as the improvement (differences) in scores of the different motor elements (scores are assigned to each motor element in each test). And of course, the way to check the significant of these differences is the T test.

Then determine the correlations between improvement in performance and improvement in gestural learning scores.

Finally, according to these correlation values, we identify which components affect the speed performance more.

Investigation tools:

- 80m Run Test

Considered as a Standardized Test, which means as explained by (Cherabcha R, 2019) that the test has been prepared by specialized scientists, is designed with the highest care and has been tested several times, to authenticate its adequacy and appropriateness.

- **Statistical tools**

T test was used to test the statistical significance of the differences using XL Stat.

2.3. Research Population and sample

2.3.1. Population research

It is a number of individuals, sharing one or more characteristics, that distinguish them from other elements, or individuals, and on which the investigation focuses.

To reach our research aims, in our case the population is all the pupils of secondary school.

2.3.2. Research sample

Our study is carried out on a sample of 28 mixed pupils, (14 girls, and 14 boys) in the second year of science at the Mohamed Boudiaf Tazmalt secondary school.

II. Results

3.1. Performance outcomes between the two tests

Table No. 1. Performances of the pre and post-test

	Pre-test	Post-test	Difference	T test			
				t	DDL	P value	signification
Means	12,766	12,228	.538	2,052	27	.000	Significant
Standard deviation	,972	,976					

Source: Outcomes of the practical study.

According to the data shown above, we conclude that there are differences between arithmetic means of pre-test performance and those of the post-test equal to .538.

The T test shows that these differences are significant ($P \text{ value} = .000 < .05$)

The table above shows the existence of a difference between the mean performance of the first test and the second equal to .538.

The T test shows that these differences are significant ($P \text{ value} = .000 < .05$).

This means that an improvement in performance was recorded between the two tests.

3.2. Results of departure learning between the pre and post-test

Table No. 2. scores of departure's means between pre and post-test

	Pre-test	Post-test	Difference	T test			
				t	DDL	P value	signification
Means	1,107	2,071	-.964	2,052	27	.0001	Significant
Standard deviation	,416	,539					

Source: results of the practical study.

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The previous outcomes indicate the existence of differences between departure means of the pre-test and those of the post-test equal to 0.964. T test shows that these differences are significant ($P \text{ value} = .001 < .05$), therefore there is an improvement in the departure technique scores.

2.3. Results for Segmental Attitude.

Table No. 3. Segmental Attitude scores between pre and post-test

	Pre-test	Post-test	Difference	T test			
				T	DDL	P value	Signification
Means	2,179	2,179	18	2,052	27	1,000	Note significant
Standard deviation	.390	.476					

Source: results of the practical study.

The previous table shows the existence of differences in means of segmental attitude between the pre-test and post-test scores equal to 1.8.

T test indicates that these differences are not significant ($P \text{ value} = 1.000 > .05$), this result means that the attitude is slightly improved.

2.4. Results for finishing learning between the two tests

Table No. 4. Results relating to the learning of finishing

	Pre-test	Post-test	Difference	T test			
				T	DDL	P value	Signification
Means	1,464	2,286	- .821	2,052	27	,0001	Significant
Standard deviation	,576	,713					

Source: results of the practical study.

This table shows differences going to 0.821 on means

The T test allows us to conclude that the differences are significant ($P \text{ value} = .001$ less than 0.05).

Therefore, the pupils learned to maintain their acquired maximum speed until the finish line.

2.5. Correlation between different learnings and performance variation

Table No. 5. Correlation coefficients

Elements of comparison	Correlation coefficients
Correlation (performance, departure)	.45
Correlation (performance, corridor running)	.40
Correlation (performance, segmental attitude)	.38
Correlation (performance, finish)	.50

Source: results of the practical study.

The correlation values between performance and other elements vary between:

- .45 correlation between performance and the departure technic.
- .40 correlation between performance and running in the corridor.
- .38 correlation between performance and segmental attitude.
- .50 correlation between performance and the finish.

By comparing the results obtained for the different technical elements, we can see the existence of weak correlations, however:

- Firstly, the improvement in performance depends on how the pupil finishes his race, because this is where students lose the most time.
- Then the start, a complicated step and therefore consumes time, so any improvement leads considerably to the improvement of performance.
- As for running in the corridor, by its impact on velocity it affects the improvement of performance.
- And finally the segmental attitude which did not record a significant difference, it is very little linked to the improvement of performance.

3. Discussion

To explain the improvements in pupils performance despite the limitations related to the training methodology, in particular the volume of work considered very insufficient, to obtain a possible improvement in speed quality.

After presentation and discussion of the results of this research, we found that:

- Although the speed lessons are limited to 6-7 lessons of 50 min / lesson, but there is a clear improvement in performance as indicated by the calculated differences in performance (significant).
- The improvement in performance recorded does not depend on a single parameter, but is subordinate to all the technical elements of the speed race; this is consistent with the study of Benmansour A and al, (2013).
- The progress in performance is mainly related to the improvement of the finishing technic, because quite simply it is here where pupils lose time, since they begin to slow down after reaching their maximum speeds a few meters before reaching the finish line. This means that it is required to devote more time to it to ensure a better development.
- At the second level, we find the starting position, the improvement of which in turn has considerably infected the decrease in the total time of the race given its technical complexity; this requires devoting a significant amount of time and work volume to it and compatible with its complexity and importance in improving performance.
- The importance of running inside the corridor lies in avoiding zigzags that increase the distance traveled and therefore the time emitted. However, the presence of a corridor previously drawn on the ground facilitates the task and does not require a big volume of work as for the segmental attitude; its contribution is low although other studies such as (Boulatoik N, 2018): motor is correlated with the quality speed.

In general, the correlation between improved running performance and gesture learning with secondary school pupils is strongly linked. The study

conducted showed that the acquisition of precise and fluid gesture skills was strongly associated with a significant improvement in the speed, which confirms our hypotheses.

III. Conclusion

The results obtained allow teachers to identify the contribution of each element of gesture learning, in the progress of performance among secondary school pupils, and creating more relevant learning units, for better results.

Gesture learning allows pupils to develop their motor coordination, dexterity and precision, which has a direct impact on their overall performance. Better mastery of gestures allows pupils to complete tasks more quickly and efficiently, which results in increased productivity and more results that are satisfactory.

However, this subject requires further research to clarify the possible involvement of other variables such as the nature of the practice spaces, didactic means involved, and the pupil's body type. etc.

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