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Effectiveness of School-Based Physical Education Programs on Long Jump Performance in Middle School Students

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Abstract

School curricula and physical education (PE) programs serve as fundamental tools for promoting motor skill development and sport-specific performance in adolescents. Despite its inclusion in the official PE curriculum, empirical evidence on school-based long jump programs in Algeria remains limited.

This study evaluated the effectiveness of a structured long jump instructional program on performance outcomes in fourth-year middle school students in Biskra, Algeria.

A descriptive pre-post design was implemented with 164 students (74 boys, 90 girls; age range 14-17 years) enrolled in three public middle schools. Long jump performance was assessed before and after a 9-session instructional program specifically oriented toward technical and physical components of the long jump, integrated into regular PE classes. Each session lasted approximately 60 minutes and was delivered once per week. The intervention focused on four phases: approach, take-off, flight, and landing. Paired-sample t-tests were used to assess pre-post changes, with significance set at $p < 0.01$.

For boys, mean performance increased from 3.27 m (SD = 0.67) to 3.43 m (SD = 0.66), with a very strong correlation between pre- and post-test scores ($r = 0.87$) and a statistically

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significant paired t-test ($t = -4.071$, $p < 0.01$). For girls, mean performance improved from 2.30 m (SD = 0.53) to 2.43 m (SD = 0.49), with a strong correlation ($r = 0.785$) and a significant t-value ($t = -3.638$, $p < 0.01$).
A structured, curriculum-based long jump program can significantly enhance performance in both sexes at the middle school level. The results support the integration of technically focused and anthropometrically informed content into school physical education curricula.
Keywords: long jump; physical education; middle school; training program; performance; adolescence

1. Introduction

School curricula and physical education (PE) programs are central tools through which educational systems pursue academic, physical, and psychosocial goals in line with the cultural and social context of a given country[1]. In many systems, PE is expected not only to promote health and physical fitness but also to develop motor skills and sport-specific performance in a progressive, age-appropriate manner[2].
Within this framework, systematic assessment is essential to determine whether curricular goals are actually being met. Standardized field tests, such as the long jump, are commonly used to evaluate motor abilities, explosive power, and the impact of instructional content on students' performance. By comparing pre- and post-intervention results, educators can gauge the effectiveness of PE programs and make evidence-based adjustments[1].
The effectiveness of such programs depends on multiple elements: clearly defined and achievable objectives, appropriate content and methodology, valid assessment tools, adequate facilities and equipment, and competent teachers[3][4]. In addition, sex-related growth characteristics (e.g., height, body mass) and psychosocial factors (e.g., attitudes and motivation toward physical activity) must be taken into account, especially during adolescence, when marked inter-individual differences emerge[5].
In Algeria, the long jump is part of the official PE curriculum at the middle school level, yet empirical data on the effectiveness of school-based long jump programs remain limited. The present study addresses this gap by examining the impact of a structured, curriculum-aligned long jump program on performance among fourth-year middle school students.

1.1 Study Objectives

The primary aim of this study was to determine whether the proposed instructional program leads to significant improvements in long jump performance among boys and girls. It was hypothesized that both groups would show statistically significant gains from pre- to post-test.

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2. Materials and Methods

2.1 Study Design

A descriptive pre-post design was used. The intervention consisted of a 9-session instructional program in long jump, integrated into regular PE classes for fourth-year middle school students. Two sessions were allocated to assessment (pre-test and post-test), and seven sessions focused on learning and practicing long jump skills. Each PE session lasted approximately 60 minutes and was delivered once per week, in accordance with the official timetable.

2.2 Setting and Participants

The study was conducted in three public middle schools in the municipality of Biskra, Algeria. The initial pool of participants comprised all fourth-year students enrolled in PE classes under the supervision of qualified PE teachers. After excluding students who did not meet inclusion criteria (e.g., repeating the school year, regular participation in sports clubs), the final sample consisted of 164 students: 74 boys and 90 girls, aged 14-17 years.

2.3 Intervention Program

The instructional program focused on the four phases of the long jump: approach, take-off, flight, and landing[6]. Teaching content included:

- Progressive development of the approach run (stride regulation, rhythm, and speed)
- Technical work on take-off mechanics (impulse, body alignment, and support)
- Practice of flight techniques, with emphasis on the scissors technique
- Landing drills aimed at maximizing effective jump distance and ensuring safety

Sessions combined technical drills, strength and power exercises using body weight, and short sprints to reinforce approach speed[8]. Instruction was individualized where possible (e.g., adjustment of approach length) and supported by corrective feedback from the teacher.

2.4 Variables and Control of Confounders

The independent variable was the proposed long jump instructional program. The dependent variable was long jump performance, measured as horizontal distance achieved in meters.

Several potential confounders were controlled to reduce bias:

- Students repeating the fourth year were excluded, as they had already been exposed to a similar program
- Students with regular training in sport clubs were excluded to limit external training effects
- All assessments were conducted on the same type of surface and with similar equipment across schools

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- Only classes taught by qualified PE teachers were included, to minimize variability in instructional quality

2.5 Measurement Procedures

Long jump performance was assessed using a standardized field test. After a general warm-up, students performed the long jump with a running approach, following the rules and safety guidelines used in school athletics. Distances were recorded in meters for each participant at pre-test and post-test. The best valid attempt was retained for analysis.

2.6 Statistical Analysis

Data were entered and analyzed using SPSS (Statistical Package for the Social Sciences). Descriptive statistics (mean, standard deviation) were computed separately for boys and girls at pre- and post-test. Pearson correlation coefficients were calculated to examine the relationship between pre- and post-test scores. Paired-sample t-tests were used to assess the significance of pre-post changes, with the level of significance set at $p < 0.01$.

3. Results

3.1 Boys

For boys (n = 74), mean long jump performance increased from 3.27 m (SD = 0.67) at pre-test to 3.43 m (SD = 0.66) at post-test. The Pearson correlation coefficient between pre- and post-test scores was r = 0.87, indicating a very strong association.

The paired-sample t-test revealed a mean difference of -0.164 m, with a calculated t-value of -4.071 (df = 73, p = 0.000), which is below the 0.01 threshold. This indicates a statistically significant improvement in long jump performance following the instructional program for boys.

Group	Pre-test Mean (SD)	Post-test Mean (SD)	Correlation (r)	t-value (p)
Boys	3.27 (0.67) m	3.43 (0.66) m	0.87	-4.071 ($p < 0.01$)

Table 1: Long jump performance outcomes for boys (n = 74)

3.2 Girls

For girls (n = 90), mean long jump performance increased from 2.30 m (SD = 0.53) at pre-test to 2.43 m (SD = 0.49) at post-test. The Pearson correlation coefficient between pre- and post-test scores was r = 0.785, reflecting a strong relationship.

The paired-sample t-test showed a mean difference of -0.123 m, with a calculated t-value of -3.638 (df = 89, p = 0.000), also below the 0.01 level. Thus, the program produced a statistically significant improvement in long jump performance for girls as well.

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Group	Pre-test Mean (SD)	Post-test Mean (SD)	Correlation (r)	t-value (p)
Girls	2.30 (0.53) m	2.43 (0.49) m	0.785	-3.638 ($p < 0.01$)

Table 2: Long jump performance outcomes for girls (n = 90)

Overall, both hypotheses were supported: boys and girls demonstrated significant gains from pre- to post-test.

4. Discussion

The main finding of this study is that a relatively short, school-based instructional program in long jump can significantly improve performance in both male and female middle school students. The observed increases in mean jump distance, combined with strong pre-post correlations, suggest that students not only improved but did so in a consistent manner across the sample.

From a biomechanical perspective, long jump performance depends on approach speed, take-off mechanics, and the effective use of body dimensions such as leg length and overall height[6][7]. The program emphasized the regulation of stride length and rhythm during the approach run, which likely contributed to more efficient speed generation and better positioning for take-off[3].

The literature in athletics and sports science highlights strong relationships between anthropometric characteristics and performance in jumping events, with taller individuals and those with favorable body mass profiles often achieving better results[7]. Strength and power, particularly in the lower limbs, play a crucial role in overcoming inertia and maximizing propulsive forces at take-off[5]. School-based programs that integrate strength-oriented exercises using body weight and short sprints can therefore enhance both neuromuscular and technical aspects of the long jump[9].

The positive results observed here may also be partly explained by previous exposure to sprinting activities within the curriculum, which could have provided a foundation for developing approach speed. The integration of feedback, individualized adjustment of approach steps, and the use of a consistent technique (e.g., scissors style) are additional pedagogical factors that likely supported performance gains[8].

These findings have practical implications for PE curricula. They suggest that targeted, technically oriented content can be successfully implemented within the time and resource constraints of public middle schools, without requiring expensive equipment. At the same time, they underscore the importance of teacher expertise and structured progression in skill acquisition[4].

4.1 Limitations

Several limitations should be noted. First, the study did not include a control group, which limits causal inferences about the intervention. Second, the relatively short intervention period (nine sessions) may not capture long-term retention of performance gains. Third, external factors such as maturation and previous physical activity outside school were not fully controlled. Future studies should consider randomized controlled designs with longer follow-up periods.

5. Conclusion

The proposed long jump instructional program, implemented within regular PE classes over nine sessions, led to statistically significant improvements in long jump performance among fourth-year middle school boys and girls in Biskra, Algeria. The results support the effectiveness of structured, curriculum-aligned PE interventions that combine technical training, speed development, and the pedagogical use of students' anthropometric characteristics.

Future research could compare different instructional models, explore long-term retention of performance gains, and examine how similar programs impact other track-and-field events or broader physical fitness indicators. The integration of such evidence-based programs into national PE curricula may enhance both student performance and overall physical literacy during critical developmental periods.

References

[1] Jaber N. The relationship between testing, measurement and evaluation in the teaching of school subjects. *Al-Makhbar Journal*. 2005;2:9.

[2] Darke KM, et al. High school sports programs differentially impact participation by sex. *J Sport Health Sci*. 2015;4:286.

[3] Zahir AR. *Mechanics of Training and Teaching Track and Field Events*. Cairo: Markaz Al-Kitab; 2009. p. 164.

[4] Al-Basati AA. *Principles of Sports Training and Applications*. Alexandria: Manshatat Al-Maaref; 1998. p. 11.

[5] Riyadh O. *Sports Medicine and Track and Field*. Cairo: Dar Al-Fikr Al-Arabi; 2003. p. 264.

[6] Zahir AR. *Physiology of Jumping Events*. Cairo: Markaz Al-Kitab; 2000. p. 20.

[7] Jawad A. Anthropometric and biomechanical variables and their relation to jumping skills. *J Phys Educ Sci*. 2013;6(3):151-153.

[8] Saad Allah FJ. *Fundamentals of Motor Learning*. Amman: Dar Al-Ridwan; 2015. p. 306.

[9] Al-Amiri HN. *Effect of Educational Programs on Motor Aspects and Technical Performance in the Long Jump for Beginners*. Amman: Dar Dijlah; 2016. p. 134.