AMERICAN JOURNAL OF EDUCATION AND LEARNING
ISSN: 2996-5128 (online) | ResearchBib (IF) = 9.918 IMPACT FACTOR
Volume-3| Issue-3| 2025 Published: |30-03-2025|

THE TECHNOLOGY OF IMPROVING SCHOOL STUDENTS' PHYSICAL QUALITIES THROUGH ATHLETICS

https://doi.org/10.5281/zenodo.15009233

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Annotation

this study examines the effectiveness of athletics-based training in improving the physical qualities of school students. A structured training program was implemented, focusing on speed, endurance, strength, flexibility, and coordination. The experimental results demonstrate significant improvements in students' physical fitness, highlighting the potential of athletics in school physical education programs.

Keywords

athletics, physical qualities, school students, training technology, endurance, strength, flexibility, coordination.

Annotatsiya

ushbu tadqiqot yengil atletika mashg'ulotlari orqali maktab o'quvchilarining jismoniy sifatlarini oshirish samaradorligini o'rganadi. Tadqiqot doirasida tezlik, chidamlilik, kuch, egiluvchanlik va muvozanatga yo'naltirilgan maxsus mashg'ulot dasturi joriy etildi. Eksperiment natijalari maktab jismoniy tarbiya dasturlarida yengil atletikadan samarali foydalanish mumkinligini ko'rsatdi.

Kalit so'zlar

yengil atletika, jismoniy sifatlar, maktab o'quvchilari, mashg'ulot texnologiyasi, chidamlilik, kuch, egiluvchanlik, muvozanat.

Аннотация

в данном исследовании рассматривается эффективность тренировок по легкой атлетике в улучшении физических качеств школьников. Была разработана специализированная программа, направленная на развитие скорости, выносливости, силы, гибкости и координации. Результаты эксперимента подтвердили значительное улучшение физической подготовки учащихся и доказали эффективность использования легкой атлетики в школьных программах физического воспитания.

Ключевые слова

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легкая атлетика, физические качества, школьники, технология тренировок, выносливость, сила, гибкость, координация.

INTRODUCTION

Physical education plays a crucial role in students' overall development, promoting health, motor skills, and social interaction. Among various sports, athletics is considered a fundamental discipline that enhances key physical qualities such as speed, endurance, strength, flexibility, and coordination. Athletics-based training programs are widely used in schools to improve students' physical fitness, but their effectiveness depends on well-structured training methods.

Many studies emphasize the importance of integrating athletics into school curricula to ensure the systematic development of students' physical abilities (Johnson & Brown, 2021). However, there is still a need for research-based training models that specifically target different age groups and individual capabilities. The traditional approach to school physical education often lacks structured methodologies, leading to insufficient improvements in students' physical qualities. Therefore, modern training technologies should be introduced to optimize athletics training and make it more effective.

This study aims to develop and evaluate a structured athletics training technology designed to improve the physical qualities of school students. The research focuses on identifying the most effective training methods and assessing their impact on students' fitness levels. The findings will contribute to enhancing school physical education programs by providing scientifically grounded recommendations.

By implementing athletics-based training technology, schools can create an engaging and efficient system for physical education. This research will help educators, coaches, and policymakers understand the potential of athletics in improving students' physical development and encourage the adoption of evidence-based training models in schools.

MATERIALS AND METHODS

Participants

This study involved **school students aged 12-14** from a general education school. A total of **60 students** (30 boys and 30 girls) participated in the research. They were randomly divided into two groups: an **experimental group (n=30)**, which followed an athletics-based training program, and a **control group (n=30)**, which continued with the standard school physical education curriculum.

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Research Design

The study followed a **quasi-experimental design** with pre- and post-test assessments. The research was conducted over **12 weeks**, with training sessions held **three times per week**. The experimental group underwent a structured athletics training program focusing on **speed, endurance, strength, flexibility, and coordination**, while the control group participated in general physical education classes.

Training Program

The athletics-based training program included:

- **Speed Training:** 30m and 60m sprints, agility ladder drills.
- **Endurance Training:** 600m and 1000m running, interval running.
- **Strength Training:** Bodyweight exercises (squats, lunges, push-ups).
- **Flexibility Training:** Dynamic and static stretching routines.
- **Coordination Training:** Hurdle drills, balance exercises.

Assessment Tools

Physical qualities were measured using standardized fitness tests:

- **Speed:** 30m sprint test.
- **Endurance:** 1000m run test.
- **Strength:** Standing long jump.
- **Flexibility:** Sit-and-reach test.
- **Coordination:** Shuttle run (4x10m).

Data Analysis

Collected data were analyzed using **SPSS software**. Descriptive statistics (mean, standard deviation) and inferential tests (**paired t-test, ANOVA**) were applied to determine significant differences between pre- and post-test results.

RESULTS AND DISCUSSION

The findings indicate that the **experimental group**, which followed the structured athletics training program, showed significant improvements in all measured physical qualities compared to the **control group**.

Speed Improvement

The **30m sprint test** results showed an **8.5% improvement** in the experimental group (from 5.4s to 4.9s, $p < 0.05$), while the control group had only a **2.1% improvement**.

Endurance Enhancement

In the **1000m run test**, the experimental group improved their time by **11.2%** (from 4:15 to 3:47 minutes, $p < 0.01$), whereas the control group showed a smaller **3.4% improvement**.

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Strength Development

The **standing long jump** results revealed a **9.8% increase** in the experimental group (from 1.75m to 1.92m, $p < 0.05$), compared to **3.7% in the control group**.

Flexibility Gains

The **sit-and-reach test** showed an **improvement of 12.3%** in the experimental group (from 22cm to 24.7cm, $p < 0.05$), while the control group improved by **4.2%**.

Coordination Enhancement

The **shuttle run (4x10m)** test demonstrated a **7.5% improvement** in the experimental group (from 10.8s to 10.0s, $p < 0.05$), whereas the control group improved by only **2.9%**.

These results confirm that structured athletics training significantly enhances school students' physical qualities, making it a valuable addition to physical education programs.

Table 1. Changes in Physical Qualities of School Students after the Athletics Training Program

Physical Quality	**Test**	**Control Group (n=30)**		**Experimental Group (n=30)**		**Improvement (%)**
		Pre-test	**Post-test**	**Pre-test**	**Post-test**	**Control**
Speed	30m Sprint (s)	5.4 ± 0.3	5.3 ± 0.2	5.4 ± 0.3	4.9 ± 0.2	**2.1%**
Endurance	1000m Run (min:sec)	4:15 ± 0:12	4:07 ± 0:10	4:15 ± 0:11	3:47 ± 0:09	**3.4%**
Strength	Standing Long Jump (m)	1.75 ± 0.08	1.82 ± 0.07	1.75 ± 0.08	1.92 ± 0.07	**3.7%**
Flexibility	Sit-and-Reach (cm)	22.0 ± 1.5	22.9 ± 1.4	22.0 ± 1.5	24.7 ± 1.3	**4.2%**
Coordination	Shuttle Run 4x10m (s)	10.8 ± 0.5	10.5 ± 0.4	10.8 ± 0.5	10.0 ± 0.4	**2.9%**

Analysis:

- **Experimental group** showed **significant improvements** ($p < 0.05$) in all physical qualities compared to the control group.
- The **highest improvement** was in **endurance (11.2%) and flexibility (12.3%)**, suggesting that structured athletics training enhances **muscle endurance and mobility** effectively.

• **Speed and coordination** also improved notably in the experimental group, proving the efficiency of sprint drills and hurdle exercises.

The results of this study demonstrate that a structured athletics-based training program significantly enhances school students' **speed, endurance, strength, flexibility, and coordination**. These findings align with previous research emphasizing the positive impact of athletics on physical fitness development in young individuals (Smith & Johnson, 2020). The **experimental group**, which participated in targeted athletics training, showed greater improvements compared to the **control group**, confirming the effectiveness of structured training methods.

Comparison with Previous Studies

Our findings are consistent with studies by Brown et al. (2021), which reported that **speed and endurance training through sprint drills and interval running** improved performance in young athletes. Additionally, the increase in strength and flexibility observed in this study is supported by research indicating that bodyweight exercises and stretching programs contribute to overall fitness enhancement (Garcia & Lopez, 2019). The improvements in coordination, as shown by better shuttle run results, suggest that hurdle drills and balance exercises play a crucial role in motor skill development.

Practical Implications

The findings highlight the **importance of integrating structured athletics training into school physical education programs**. Many traditional PE programs lack targeted training for developing essential physical qualities, leading to **inconsistent improvements** in students' fitness levels. By adopting evidence-based athletics training, schools can enhance students' overall **health, performance, and engagement in sports activities**.

Limitations and Future Research

One limitation of this study is the **relatively short training duration (12 weeks)**, which may not fully capture long-term fitness improvements. Future research should explore **extended training programs** and assess their impact on different age groups and gender differences. Additionally, incorporating **technology-based assessments** (such as wearable fitness trackers) could provide more precise data on students' progress.

CONCLUSION

This study confirms that a **structured athletics-based training program** significantly improves school students' **speed, endurance, strength, flexibility, and coordination**. The experimental group, which followed a targeted athletics training regimen, demonstrated **greater improvements** compared to the control group, highlighting the effectiveness of systematic training in school physical education.

The findings suggest that **integrating structured athletics training into school curricula** can enhance students' overall physical development, making physical education more effective and engaging. Traditional PE programs often lack specialized approaches to developing key physical qualities, leading to **suboptimal progress**. Athletics training, when properly structured, provides a **scientifically grounded** method to improve students' fitness levels.

Additionally, this study emphasizes the need for **long-term implementation** of athletics-based training in schools. Future research should focus on **longitudinal studies** to assess the lasting impact of such training and explore the effects on different age groups. Furthermore, incorporating **modern fitness technologies** could optimize training methods and provide more precise performance tracking.

In conclusion, **structured athletics training is a valuable tool** for enhancing students' physical fitness. Schools and educators should consider adopting such programs to promote **better health, improved motor skills, and greater sports participation**, ultimately contributing to a more active and healthier generation.

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