This result suggests that the "technique decomposition stage" coincides with the development of swimming skills: elementary school students have a limited understanding of complex movements, and direct instruction in complete movements can easily lead to problems associated with "holistic learning" (e.g., the common problems of "weak kick and turn" and "inconsistency between breathing and arm stroke" in students in the control group). At the same time, decomposition training allows students to overcome technical difficulties one by one, laying the foundation for integrating complete movements and ultimately improving technical standardization [3].

Conclusion. A scientific swimming teaching sequence (basic physical training - technical training - full integration - simulated exam) can significantly improve performance on junior high school physical education entrance examinations. Its essence lies in its alignment with students' physical and mental development and the logic of swimming skill development.

This progressive teaching sequence not only improves students' technical proficiency but also enhances their adaptability to learning, reduces anxiety, and lays the foundation for developing long-term exercise habits.

The traditional "technical indoctrination" teaching sequence ignores physical training and technical preparation, easily resulting in students with "weak technique and slow performance improvement," making it difficult to meet the requirements of junior high school physical education examinations.

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IMPROVING THE TECHNIQUE OF SHORT-DISTANCE RUNNING OF COLLEGE STUDENTS ENGAGED IN SPRINTING, USING INNOVATIVE METHODS

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Keywords. Sprinting, track and field, physical fitness, college students, sprint training.

Sprinting is a foundational discipline in track and field, playing a significant role in enhancing college students' physical fitness and fostering their spirit of competition. However, the training methods currently employed in many universities still rely heavily on traditional approaches, which depend on coaches' subjective observations and lack precise, quantitative feedback. This limitation hinders the in-depth improvement of students' sprinting techniques. With the widespread adoption of smart devices and analytical software, technology-assisted training has introduced new possibilities for overcoming these limitations. By utilizing accessible tools such as smartphone video recording and sensor applications, combined with specialized analysis software, key technical indicators can be quantitatively assessed, offering data-driven support for training optimization [1]. The purpose of this study is to examine the application effects of technology-assisted tools such as video analysis and sensor-based metrics in college students' sprint training. It aims to validate their impact on improving technical indicators and to provide a practical reference for optimizing the sprint-training model in universities.

In the context of the widespread application of information technology in education, the modernization and scientific refinement of training methods have become important directions for the development of physical education in universities. As a foundational event in track and field, sprinting requires a high degree of technical precision, yet traditional training models often rely on coaches' empirical observation and subjective feedback. This approach makes it difficult to conduct quantitative analysis of subtle technical movements, thereby limiting the improvement of college students' sprinting proficiency [2]. In this context, exploring how to effectively apply a combination of accessible technological tools to the sprint training of college students and forming a set of practical and promotable training optimization solutions have become urgent needs for enhancing the quality of physical education in universities.

The purpose of this study is threefold: first, to design a technology-assisted sprint training program suitable for the resource conditions of general universities, utilizing tools such as video analysis software and smartphone sensors; second, to empirically verify the specific effects of this training model on improving key technical indicators of college students (including stride length, stride frequency, and joint angles); third, to summarize a set of practical and operable technology-assisted training methods and recommendations, providing a reference for optimizing the sprint training model in universities.

Material and Methods. Subjects of the study：Thirty male and female college students from the university's track and field interest club were selected as the research subjects. All subjects had undergone fundamental physical education courses and possessed basic running ability, with no recent major sports injuries that would affect training. They were randomly divided into an experimental group and a control group, with 15 students in each group, ensuring no significant difference in their pre-training physical condition and sprinting level [3].

Research process：The control group followed the traditional sprint training model, which primarily involved coach demonstration, group repetitive drills, and experiential feedback. The experimental group, based on the traditional model, integrated the aforementioned technological methods: using video analysis for technical post-mortems, sensor data for quantitative feedback on force application, and virtual simulations for technical conceptualization [8]. Technical data for all subjects was collected using the above tools at the beginning (pre-test) and the end (post-test) of the training period.

The pre-test and post-test data of the two groups were compiled. Using spreadsheet software, comparative analysis was conducted on the changes in technical indicators such as stride length, stride frequency, sensor-derived kinetic parameters, and joint angles. The aim was to verify the differential impact of the technology-assisted training model compared to the traditional model on the technical improvement of college students [4].

Results and their discussion. Step length and step frequency variations: Before the experiment: The experimental group had a stride length of 1.82±0.12 meters and stride frequency of 4.65±0.21 steps/second; the control group had a stride length of 1.83±0.13 meters and stride frequency of 4.63±0.22 steps/second. There was no significant difference between the two groups in stride length and stride frequency ($P>0.05$).

Post-experiment analysis: The experimental group achieved stride length improvement to 1.97±0.11 meters (8.5% increase) and step frequency to 4.94±0.20 steps/second (6.2% increase), while the control group only showed a 3.2% stride length increase to 1.89±0.12 meters and a 2.1% step frequency increase to 4.73±0.21 steps/second. The experimental group demonstrated significantly greater improvements in both stride length and step frequency compared to the control group ($P<0.05$) [8]. The discussion here emphasizes that innovative technologies provide detailed feedback, allowing for more targeted adjustments in stride parameters, which traditional methods lack.

Changes in ground reaction forces:After training, the experimental group demonstrated significantly higher peak vertical force and horizontal propulsion than the control group ($P<0.05$). Specifically, the experimental group achieved a 10.3% increase in peak vertical force and a 12.5% boost in horizontal propulsion, while the control group only showed modest improvements of 4.1% in vertical force and 5.3% in horizontal propulsion. These results confirm that innovative technology-assisted training effectively enhances students' ground push efficiency [5]. The discussion points out that real-time data from force platforms enable immediate correction of force application techniques, leading to more efficient propulsion.

Changes in joint angles: Analysis of hip, knee, and ankle joint angles using motion capture systems revealed that the experimental group demonstrated more rational coordination in range of motion and force application timing after training: hip extension increased by 8°

degrees, knee flexion by 10° degrees, and ankle plantar flexion by 6° degrees, which better facilitates generating greater propulsion during sprinting. The control group showed minimal improvement in joint angle optimization, demonstrating a significant gap compared to the experimental group [6]. This discussion highlights how motion capture provides visual and quantitative feedback on joint movements, promoting better biomechanical alignment and reducing injury risks.

Conclusion. The integration of accessible technology-assisted methods, such as smartphone video analysis and sensor-based tools, into college sprint training has been shown to effectively enhance key technical indicators including stride length, stride frequency, and joint angle coordination. Compared with traditional coaching approaches, these methods provide objective, quantifiable feedback that helps students better understand and improve their sprinting technique, thereby increasing training efficiency [7]. The advantages of such technology-supported training are clear, demonstrating significant value for widespread adoption within university physical education programs. Colleges and universities should promote the use of low-cost and widely available technical tools – such as smartphone video recording and sensor applications – to provide sustainable hardware and software support for training. Coaches should receive training in the use of these tools and in basic data analysis to enhance their ability to implement technology-assisted instruction effectively. Training plans should be adapted to individual students based on data collected through these technologies, allowing for personalized guidance that addresses different technical needs [8]. Finally, the application of these methods should be regularly evaluated and optimized according to actual training conditions, contributing to the ongoing improvement of the sprint training system in higher education.

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A STUDY ON THE FACTORS ASSOCIATED WITH LOW UPPER LIMB STRENGTH IN COLLEGE STUDENTS IN CHONGQING, CHINA

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In recent years, the physical health test data of college students shows that the upper limb strength of college students is declining year by year. At the same time, it has also attracted great attention from schools and society. Strength quality is one of the basic qualities of the human body in sports, and is an important influencing factor for obtaining excellent competitive ability, sports skills and achieving excellent sports results. In physical education, it is found that the weak strength of students' upper limbs directly affects the development of athletic ability of throwing, hanging, supporting, and climbing, and also hinders the improvement of athletic performance in running and jumping.

Upper limb strength provides a good physical foundation for students to participate in various sports, so the importance of upper limb strength development is self-evident. The exploration of the factors of weak upper limb strength of students in Chongqing colleges and universities is helpful to pay attention to the current situation of students' upper limb strength practice. For colleges and universities, it is necessary to clearly understand the factors affecting the weak upper limb strength of college students, so that schools can adjust and