On the Application of Dance Science Training Theory in Basic Ballet Training Instruction

Cai Ting

Guangzhou Vanzi Culture Communication Co., Ltd., Heyuan Guangdong, 517000;

Abstract: This paper aims to explore the application value and practical strategies of dance science training theory in basic ballet training instruction.It elucidates how multidisciplinary knowledge encompassing human anatomy,physiology,and biomechanics provides a scientific foundation for basic ballet training.By analyzing the current state and existing issues in basic ballet instruction,the study elaborates on specific application methods of scientific training theory across various aspects,including warm-up preparation,movement standardization,intensity control,injury prevention,and personalized teaching.The objective is to enhance the scientific rigor and effectiveness of basic ballet training,fostering students'development in the art of ballet while offering valuable references for ballet educators to optimize and innovate teaching methodologies.

Keywords: dance science training theory;basic ballet training instruction;application

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Introduction

Ballet,as an elegant and highly expressive dance form,possesses a rigorous and standardized training system.As the foundational component of ballet education,basic ballet training plays a pivotal role in shaping dancers'physical capabilities,mastering dance techniques,and cultivating artistic literacy.However,with the continuous development of dance education and increasing attention to dancers'physical and mental well-being,traditional methods of basic ballet training have gradually revealed certain limitations.Dance science training theory,leveraging its interdisciplinary advantages,offers new perspectives and approaches to address these issues and enhance the quality of basic ballet training.In-depth research on the application of dance science training theory in basic ballet instruction holds significant importance for nurturing outstanding ballet talents and advancing the inheritance and development of ballet art.

1 Analysis of Issues in Basic Ballet Training

1.1 Traditional Teaching Content and Methods

Currently,some ballet basic training still follows traditional teaching content and methods,focusing on the external imitation of movements and emphasizing the repeated practice of fixed movement combinations,while providing insufficient explanation of the scientific principles behind the movements.For example,teachers often only demonstrate the standard posture of movements and require students to mimic them,but rarely delve into analyzing the scientific aspects such as the sequence of muscle engagement,range of joint motion,and shifts in body center of gravity involved in each movement.As a result,students learn the"what"but not the"why,"making it difficult for them to truly grasp the essence of the movements and hindering their ability to innovate independently and enhance their artistic expression.

1.2 Inaccurate Control of Training Intensity

In ballet foundational training,controlling the training intensity is a critical issue.Some teachers,in pursuit of rapid results,may excessively increase the training intensity,neglecting the individual physical tolerance of students,leading to accumulated fatigue and heightened risk of injuries.Conversely,other teachers may set the training intensity too low,failing to effectively stimulate the improvement of students'physical functions,thereby compromising teaching effectiveness and the pace of student progress.Due to the lack of scientific methods and criteria for evaluating training intensity,it is difficult to achieve precise alignment between training intensity and students'physical conditions.

1.3 Lack of Personalized Teaching

Each student's physical condition,innate talents,and learning starting point are different,yet in actual teaching,a uniform teaching model and pace are often adopted,making it difficult to meet individual needs.For example,some students may have good flexibility but lack strength,while others may possess decent strength but poor flexibility.Uniform training requirements and methods may restrict the development of certain aspects for some students,preventing them from fully realizing their potential,which ultimately affects both overall teaching quality and individual student growth.

1.4 Weak Awareness of Injury Prevention

In ballet training,due to factors such as high movement difficulty and intense training load,dancers face relatively higher risks of injury.However,in some basic ballet training classes,instructors often lack sufficient emphasis on injury prevention,systematic preventive knowledge,and scientific explanations of preventive measures.For instance,before students engage in extensive jumping or rotating movements,they are not adequately guided through proper warm-up preparations.Additionally,there is insufficient emphasis on correcting incorrect postures during training and their potential injury risks,leading to frequent student injuries.These incidents not only disrupt students'normal learning and training but also negatively impact their physical and mental well-being.

2 The Specific Application of Dance Science Training Theory in Ballet Basic Training Instruction

2.1 Application in the Warm-up Preparation Phase

1.Physiological Basis of Warm-up

According to physiological principles,warm-up activities elevate body temperature,enhance blood circulation,and sufficiently prepare muscles,joints,and other areas,thereby reducing the risk of sports injuries and improving physical performance.Before ballet basic training,instructors can design diversified warm-up activities based on this principle,such as slow-paced dynamic stretches focusing on frequently used joints in ballet training—ankles,knees,hips,and the spine—to gradually acclimate the body to the upcoming high-intensity exercises.

2.Selection of Warm-up Movements Based on Biomechanics

From a biomechanical perspective,warm-up movements should activate muscle groups relevant to ballet techniques and help students establish proper force transmission and body balance.For instance,simple in-place jumps or rotational exercises can be incorporated to allow students to experience shifts in body weight and the mechanics of foot propulsion,laying the groundwork for subsequent formal ballet movements like jumps and turns.Through scientifically designed warm-up preparations,students can enter the basic training session in optimal condition,enhancing training effectiveness while minimizing injury risks.

2.2 Application in Standardized Movement Instruction

1.Clarifying Force Application Points Through Human Anatomy

When teaching fundamental ballet training movements,utilizing knowledge of human anatomy allows instructors to clearly explain the correct force application points for each movement.For instance,when performing the"Plie"teachers can demonstrate the anatomical diagrams of leg muscles to help students understand that the movement primarily relies on the coordinated effort of the quadriceps femoris at the front of the thigh,the biceps femoris at the back,and the gluteus maximus in the buttocks.Simultaneously,the knee and ankle joints must flex and extend appropriately to maintain body stability and movement standardization.This approach enables students to grasp the essentials of the movement more accurately,avoiding deformations or injuries caused by incorrect force application.

2.Optimizing Movement Trajectories Using Principles of Biomechanics

The principles of biomechanics can help refine ballet movement trajectories,making them more aligned with mechanical laws to achieve graceful and stable results.Taking the"Grand Jete"as an example,teachers can apply biomechanical analysis to examine the forces and movement trajectories of various body parts during the takeoff,aerial,and landing phases.This guides students on how to generate upward initial velocity through powerful leg propulsion during takeoff,maintain balanced body posture in mid-air,and absorb impact forces during landing to disperse shock.Consequently,students can perform grand leaps with greater lightness,fluidity,and safety,thereby enhancing the quality of their movements.

2.3 Applications in Training Intensity Control

1.Determining Individual Intensity Based on Physiological Indicators

Physiological indicators such as heart rate,blood pressure,and blood lactate levels can reflect exercise intensity and fatigue levels.Teachers can monitor these physiological metrics during training and,considering factors like the student's age and physical condition,establish appropriate intensity ranges for each student.For example,for younger beginners with lower physical fitness,maintaining a heart rate of 120-140 beats per minute during training is generally suitable.For more advanced students with better physical conditioning,heart rates can be moderately increased to 160-180 beats per minute during high-intensity combination exercises.However,prolonged exposure to excessively high heart rates should be avoided to prevent overfatigue and injury.

2.Utilizing Training Periodization Theory for Long-Term Intensity Planning

Drawing from sports training periodization theory,the ballet foundational training process can be divided into distinct phases,such as the preparatory phase,competition phase(for students with performance requirements),and recovery phase.Each phase involves appropriate intensity adjustments based on specific goals.The preparatory phase focuses on building foundational abilities with moderate intensity,the competition phase increases intensity to emphasize technical and expressive improvements,while the recovery phase reduces intensity to prioritize physical recuperation and adjustment.This structured and rhythmic intensity progression helps students gradually enhance their physical capabilities while avoiding the negative effects of prolonged high-intensity training.

2.4 Applications in Injury Prevention

1.Identifying Vulnerable Areas Through Human Anatomy Analysis

Human anatomy enables instructors and students to clearly recognize body parts prone to injuries during ballet training,such as joints and muscle groups in the ankles,knees,and lower back that are particularly vulnerable.During instruction,teachers can emphasize proper protective techniques and movement skills for these high-risk areas,reminding students to pay special attention to maintaining correct postures and avoiding harmful motions like excessive twisting or overextension.For instance,during pointe work training,detailed explanations should be provided on proper ankle engagement and achieving stable support.By demonstrating correct versus incorrect techniques,instructors help students recognize the risks of missteps and reinforce the importance of precise,standardized postures to prevent injuries to these susceptible areas.

2.Correcting Improper Postures Using Biomechanics

Applying biomechanical principles allows for timely correction of flawed movement patterns during training,as many injuries stem from improper force distribution or excessive joint stress caused by incorrect postures.For example,when executing turns,students may lose balance

and fall if their center of gravity is unstable or if head movements are improperly coordinated.Leveraging biomechanics,instructors analyze force dynamics during rotational movements,guiding students to adjust body alignment,locate optimal balance points,and adopt scientifically sound turning techniques.This approach ensures training proceeds safely and systematically by minimizing injury risks from technical errors.

2.5 Applications in Personalized Teaching

1.Developing Training Plans Based on Students'Physical Conditions

Each student possesses unique physical attributes.For instance,some may exhibit innate flexibility but lack strength.For such students,in ballet foundational training,teachers can emphasize strength-building exercises while maintaining flexibility training.This involves designing specialized strength-enhancement plans,such as incorporating more core muscle workouts for the legs and abdomen,to help students address weaknesses and achieve well-rounded development.Conversely,for students with adequate strength but limited flexibility,teachers should devise scientifically grounded flexibility training programs.Employing progressive stretching techniques—starting with simple static stretches and gradually advancing to more challenging movements—can expand the body's range of motion and enhance flexibility.This approach enables students to execute ballet movements with greater grace and extension,elevating the expressiveness and aesthetic appeal of their dance.

2.Adapting Teaching Content to Students'Learning Progress

Given variations in students'learning paces,teachers should flexibly adjust instructional content.By closely observing their performance and identifying specific weaknesses—such as the precision of basic movements or transitions between steps—teachers can provide targeted explanations and repetitive practice.This reinforces foundational skills,solidifies their base,and helps them gradually align with the overall teaching progression.Such personalized teaching strategies cater to the developmental needs of individual students,unlocking their latent dance potential.Consequently,this enhances the overall quality of instruction and fosters the sustainable advancement of ballet education.

3 Conclusion

The application of dance science training theory in ballet foundational training holds significant practical importance. It can address numerous shortcomings present in traditional ballet foundational instruction by scientifically integrating it into various aspects such as warm-up preparation, movement standardization, intensity regulation, injury prevention, and personalized teaching. This approach makes ballet foundational training more aligned with human physiological characteristics and biomechanical principles, thereby enhancing the scientific rigor and effectiveness of teaching, reducing students' injury risks, and fostering their individualized growth and holistic development. However, to fully leverage the advantages of dance science training theory, dance educators must continuously deepen their study and research on this theory, better incorporating it into daily teaching practices. Simultaneously, further strengthening the integration of scientific research with teaching is essential to continually refine and enrich the theoretical system of dance science training, cultivating more outstanding talents for ballet art and propelling its brilliance in the new era.

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