International Journal of Physical Education and Sports Sciences
Vol. 13, Issue No. 07, October-2018, ISSN 2231-3745

A Study on Biomechanics' Function in Physical and Athletic Education

Dr. Meenakshi Tripathi*

Assistant Professor, Physical Education, Krishna Devi Girls Degree College, Lucknow, Uttar Pradesh

Abstract – Physical educators teach a broad spectrum of human motions, and biomechanics are essential to the evaluation of technology and action to enhance youth. Biomechanics also helps physical educators to recognize movements and physical activity that lead to different muscle groups and components of health. Biomechanics in sports and training relates to the analysis and execution of human activities, and the interplay between participants, exercise equipment and the work-out environment. The students in particular need support to boost their strength, but also they have challenges including how the human body works, how to learn motor skills etc .. What strategies should be used? Physical activity presents numerous physical workout examples, while biomechanical analyses of the form and operation of organic structures via the mechanical methodology include suitable and essential techniques for learning physically different muscle and health components and skills in the physical division, which include study of the activities of force in biomechanics. The usage of mechanics of human movements is biomechanics. Biomechanical strategies are important to enhance the physical activity of students safely and effectively.

Key Words – Biomechanics, Mechanics, Performance, Training

----------♦----------

INTRODUCTION

Biomechanics' meaning is a combination of Bio and Mechanic two terms. This is the Greek phrase biomechanics. The phrase bio refers to life, and mechanic refers to the world of mechanics and the influences that accompany the activity of the body. The composition and organization of biological species was explored in biomechanics. We research how the muscles and skeletal system function in different conditions / circumstances whether we are willing to refer humans in biomechanics. At any point of view of the necessity of all relations, the expression biomechanics is used for kineiology. We may sharpen our interpretation of the term kinesiology until we move ahead. What is kinesiology, therefore? Anatomical and physiological elements that shift limbs, muscles, tissues and neurons are correlated with kinesiology. Kinesiology It is hoped that you can recognize human motion and how it occurs. Kinesiology is rational For instance, in 1984 the Biomechanics of the Winter Olympics focused on planning rivalry with the United States Ski Team. The science of the human action, the word "kinesiology," came to them from the Greek kinesi, denotes action. The kinesiology is not only concerned with studying human activity; it also involves non-human activity.

Applying Biomechanics in Physical Education

Physical educators teach a broad spectrum of human motions, and biomechanics are essential to the evaluation of technology and action to enhance youth. Biomechanics also helps physical educators to recognize movements and physical activity that lead to different muscle groups and components of health. This chapter explains how biomechanical know-how and nine concepts of biomechanics in comparative study of human activity may be applied into other sport studies. There are five qualities that are often demonstrated in physical education. True motions and instructional metrics are used to demonstrate how biomechanics are implemented in physical education in the modern world. Qualitative examination is a vital diagnostic and evaluative capacity that can be utilized to enhance physical activity movement.

Advantage of biomechanics in sports

A comparative analysis and analyses of elite and sports performers in general was focused on sports biomechanics. The physics of sports can be only defined. The laws of physics are implemented for better awareness of athletic success by statistical modeling, computer simulation, and calculation in this sub-field of biomechanics. Bio-mechanics includes researching the structure and operation of bio-systems using the "mechanics" techniques – the

physics division that requires the interpretation of force behavior. There are two subfields of research under "mechanics": statics, which are the analysis of systems in a steady motion, or in a static movement (without motion or a constant velocity), and dynamics, which is the research of systems in motion in which there are accelerations and which may involve filmmakers.

Biomechanics of sport

It means structured, competitive, enjoyable, skilful, skilled, determined, and fair play practises, in which the winner can be decided in a collection of rules by objective means.

Area of Biomechanics

As a member of the varied areas of medicine, physiology, architecture, physical education, pharmaceutics, materials research, oral and orthopedic surgeons, cardiologists, aviation, the biomechanics was included. Additionally, biomechanics is used for teachers , coaches, coaches and physiologists throughout realistic environments. Biomechanics in physical activity has proven to be highly prominent and generally known. A individual may learn some of the characteristics of the human body and the dynamics and also use this knowledge in various fields. For example, a coach knows about the human body and the director of mechanical physics with the intention that this student learning is utilized to gain progress. In real skiing and dry field exercises the same muscles are included. Through the exercise, the mentors noticed that these familiarities allowed them to grow the longer walking duration along certain lines to enhance the execution of the colleagues. The usage of biomechanists to collaborate with national athletes and their coaches is becoming more fundamental, and biomechanists are becoming a crucial part of the workforce for drilling. Biomechanists operate today in the national planning emphasis in Colorado Springs for various game classes.

Physical exercise

By physical exercise it is intended to boost or sustain the strength, efficiency, wellbeing or welfare of some deliberate physical activity. Sports biomechanics' secondary purpose is closely linked with the main objective and a stable athlete is stronger than an individual with repeated injuries. Why will biomechanics achieve their objectives?

PERFORMANCE IMPROVEMENT

Technique Improvement

Teacher and trainers will be used to modify actions of students or competitors and develop the skill with the aid of biomechanics. In addition, biomechanics research staff will build a modern and more efficient methodology for enhanced sport motion execution. In the former example, instructors and coaches use contextual biomechanics analyses to create improvements in the technologies employed in their day-to-day instruction. In the following example, biomechanics study staff utilize theoretical techniques in biomechanics, which can then be extended to curriculum and training systems. For eg, if a gymnastics instructor considers it challenging to turn a spike, she should have three suggestions to assist the gymnastics manager correctly with this exercise:

1. In order to sail up,
2. Arms with more control prior to departure or
3. Tighter to curl up.

Both these guidelines will assist with the proper management of this mission and are based on biomechanical concepts. She will finish the change in the flight process if she hops higher. Curling tighter implies increasing the rotating speed while retaining the same angular momentum. The angular momentum that causes the gymnasts to spin faster rises by linking arms with more energy. Javelin, high jump and cross country skiing are three of the sport activities that have undergone significant advances in technology in the past.

Equipment Improvement

Using biomechanics will also give the sports equipment a better look and work. For example, sport performance may be affected by ski boots. The professional and casual players enjoy expensive sporting facilities. Researchers have recently invented a modern bathing suit that allowed swimmers to raise their world records at the Olympics in Sydney in 2000, since the bottom line and the water aid that works against swimmers are beneficial. This bath suit was probably inspired by the fact that it was eventually prohibited in swimming.

Injury Prevention

The idea of accident prevention is part of public policy and its purpose is to improve public health and therefore the quality of life. Biomehanics is a way of recognizing muscular forces and energies that trigger damage in sports medicine. It helps to learn how accidents are induced, how they are prevented during the sport and how training should be established for the prevention and recovery of accidents. Biomechanics provides the possibility to utilize modern technology and more reliable teaching strategies to establish alternate strategies for performing precise motions, which can help avoid accidents.

Injury reduction through changes to equipment function

One illustration of how biomechanics testing findings may be used in the running to enhance the functionality of sports equipment. There is a recent rise in the amount of persons who understand the

value of safe living. Running is a valid aspect of a balanced lifestyle as an integral human locomotive. However, the number of individuals participating has raised the incidence of accidents. Sports shoes in the early 1970s became too rough for professional cyclists. Stress cracks and shiny bone discomfort is among the accidents of rising prevalence. Thus, fashion makers begin selling soft sole shoes. Yet soft soils provided no reasonable stability and engine power. Ankles, ankles and hip fractures continued to be encountered by the riders. Research in biomechanics has allowed the development of running shoes that decrease impact intensity and at the same time have high stability and engine power. With the aid of biomechanics, customized shoes for particular athletes may also be prescribed. The frequency of running accidents has again reduced. Is not the right technology for operating human bodies themselves? People who wear early-age shoes often hit the ground as they move on their feet. The running style of Kenyans, who never wear shoes and claim that people instinctively hit the ground with their forefoot at barefoot running. This makes loading speeds at foot slower than in the case of shoes which first contact the ground with the back foot. Great reaction forces can trigger chronic injuries, sometimes sustained by athletes.

Function of biomechanics in physical education and sports

Help improve techniques the use in practice and sports of different advanced biomechanical principles techniques helps improve broad error detections, strengthen expertise, build and optimize qualitative and quantitative analytics with the correct and chosen instruments and instruments. In the overall success of the students the production and construction of device layout, the construction of shoes and sport wear, device for a broad range of sports equipment, equipments such as single plate imaging, automated monitoring method, electro goniometry, accelerometers, pressures scales, surface structure and laboratory exercises etc, are the primary elements of biomechanical engineering. Sports equipment is also used in physical activity and competition, as required by the concepts of biomechanics. Increased athletic success using numerous modern biomechanical concepts strategies in the field of physical activity will help to increase students ' performance in various sports. A broad variety of models of science quantitative can help enhance the player's efficiency in terms of distance , time and sport precision, such as force-motion, strength-time, acceleration, agility, control, spectrum and equilibrium. In contrast to students who don't have proper instruction, the proper guidance of biomechanical strategies gives them a great outcome. Injury avoidance The player's likelihood of injury can be minimized by ensuring appropriate treatment about origin, diagnosis, remedy and recovery by following its creative concepts. There are also corresponding methods for qualitative research to avoid and restore casualties. Muscle changes may be enhanced in healthy health by observing biomechanical rules, distinct muscle types and tissue composition. Acts such as legs kick football, leaping and grabbing, leaping long, weight training etc helps to retain the elasticity of the muscles and to build up Biceps and Tripods. Improving the framework of internal organ by means of different organised methods and biomechanics strategies in sports help to establish a good internal body organ system as multiple motions are helpful in the qualitative examination of the wellbeing of a variety of inner organ systems. Both joints perform better whenever the workout is carried out correctly.

Importance of biomechanics in sports

1. Enhances athletic results.
2. Enhance the success of athletics.
3. Allows human body to learn.
4. Establish faith in athletes.
5. Prevents injuries to athletics.
6. Study assistance.
7. Improves the methods in teaching.
8. Enhances athletes' popularity.

BIOMECHANICS IN PHYSICAL EDUCATION COURSES

In the majority of physical education (PE) courses Biomechanics is a central discipline and it is perceived to be essential in this area. Adrian and Cooper (1995) describe bio-mechanics as the "technology division which aims to understand the interaction between life 's structure and work, in terms of film and movement kinetics." This is the environment where human movement triggers are identified and researched (Knudson, 2007). While this range of expertise allows teachers to determine the most effective action in the education phase, study is also conducted into teaching and, in particular, the learning of biomechanics. Knudson (2010) has analysed papers released by conferences and journals on the teaching of biomechanics in the United States and found that there have been relatively little research on biomechanical principles and teaching methods up to that year. Given the agreement on the significance of this topic for PE professors in undergraduate study , teachers fail to implement its principles little in their work. While seldom utilized, most PE practitioners agree that the programme in biomechanics should remain (Corrêa, 2004). High intensity trainers are more knowledgeable in biomechanical ideas than instructors of PE at school according to Ladeira et. al.

(2011). Many factors can restrict the appropriation by skilled PE of biomechanical resources, such as: I the difficulties of comprehension and access to science text for specialist languages (Sanders and Sanders, 2001); (ii) the uncommon emphasis on the information produced in this field in relation to the pedagogical questions which the teachers currently use (Batista, 2001); We won't dwell in PE 's technical everyday life on the triggers of the biomechanics. It is essential to underline, though, that the issue still reflects on teaching and intellectual learning in undergraduate classes. The usage of this expertise would be more challenging for PE practitioners who have not studied the basics of biomechanics with relevance. Belmont, Batista and Lemos (2011) have reported that students in introductory biomechanics have difficulties utilizing biomechanical information for solving problems involving connection between two or more concepts. Further, most of these students were not accountable for their own learning since they were more eager than substantive learning to store meanings (Belmont & Lemos, 2012). Building on the assumption that schooling should be relevant to the effective growth of PE professionals, the theoretical basis of this essay is concrete learning theory (Novak, 2010). The aim of this article is to explore how meaningful learning theory in PE graduate courses affects the teaching and learning in biomechanics. The topic would concentrate on "what" to understand and "how" to utilize the analytical structure to explain core principles in biomechanical. We expect to work together with awareness of the teaching method that deals with meaningful biomechanical learning and thus with the training in PE.

CONCLUSION

This research finds that biomechanics play a key function in the area of physical activity and exercise. Physical educators teach a broad spectrum of human motions, and biomechanics are essential to the evaluation of technology and action to enhance youth. Biomechanics relates to the study of human behavior and the relationship between the individual, sports equipment and the fitness setting of sport and exercise. Biomechanics is a special position in the areas of Community Education, Physical Exercise and Athletics and they are constantly searching at opportunities to get quicker, more and safer while minimally wounded. It allows trainers and coaches to develop students ' physical fitness via different biomechanical strategies in various sports. It is worthy of notice for physical, mental and social growth its application in personal life , particularly to students, sport people and practitioners. To put it clearly, it plays an important role in enhancement in physical efficiency, injury process and production in appliances, the growth of internal organs, etc. Information on biomechanical operation in physical activity and sports can be provided by this analysis.

REFERENCES

Adrian, M. J., & Cooper, J. M. (1995). Biomechanics of human movement. 2nd ed. Madison, WI: Brown & Benchmark.

Knudson, D. (2007). Fundamentals of biomechanics. 2nd ed. New York: Springer.

Knudson, D. (2010). What have we learned from teaching conferences and research on learning in biomechanics? In Jensen, R. et al. (Ed.). 28 International Conference on Biomechanics in Sports, Michigan, US. Proceedings… United States: American Society of Biomechanics. https://ojs.ub.unikonstanz.de/cpa/article/view/4556

Corrêa, S. C. A (2004). Biomecânica como ferramenta de intervenção na prática profissional. In 27 Simpósio Internacional de Ciências do Esporte, São Paulo, SP. Proceedings… São Paulo: CELAFISCS, p. 290.

Ladeira, A. P. X., Corrêa, S. C., Dias, R. I., & Freire, E. S. (2011). Application of biomechanics concepts in Professional life of physical education teacher. In Vilas-Boas, J. P. et al. (Ed.). 29 International Conference on Biomechanics in Sports, Porto, Portugal. Proceedings… United States: American Society of Biomechanics. https://ojs.ub.uni-konstanz.de/cpa/article/view/4993.

Corrêa, S. C., & Freire, E. S. (2004). Biomecânica e educação física escolar: possibilidades e aproximação. [Biomechanics and school physucal education: interaction possibilities]. Revista Mackenzie de Educação Física e Esporte, 3(3), pp. 107-123.

Freitas, F. F., & Lobo da Costa, P. H. (2000). O conteúdo biomecânico na educação física escolar: uma análise a partir dos parâmetros curriculares nacionais [School Physical Education and Biomechanics: an analysis from the National Curricular Parameters]. Revista Paulista de Educação Física, 14(1), pp. 78-84.

Belmont, R. S., Batista, L. A., & Lemos, E. S. (2011). O diagrama de corpo livre como recurso de avaliação da aprendizagem significativa da biomecânica em um curso de licenciatura em educação física [The free body diagram as resource for meaningful learning evaluation in biomechanics in a physical education course]. Revista Electrónica de Investigación en Educación en Ciencias, 6(1), pp. 71-76.

Belmont, R. S., & Lemos, E. S. (2012). A intencionalidade para a aprendizagem significativa da biomecânica: reflexões sobre

possíveis evidências em um contexto de formação inicial de professores de Educação Física [Intentionality in biomechanical meanginful learning: considerations about possible evidences in a context of initial education for Physical Education teachers]. Ciência & Educação, 18(1), pp. 123-141.

Novak, J. D. (2010). Learning, creating, and using knowledge: concept maps as facilitative tools in Schools and corporations. 2nd ed. New York: Taylor & Francis.

Corresponding Author

Dr. Meenakshi Tripathi*

Assistant Professor, Physical Education, Krishna Devi Girls Degree College, Lucknow, Uttar Pradesh