

# Biomechanics in Physical Education Application of Biomechanics in Teaching Physical Education

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**ABSTRACT:-** It is the application of mechanical principles in the study of living organisms.

**SPORTS BIOMECHANICS:-** It is a quantitative based study and analysis of professional athletes and **sports'** activities in general. It can simply be described as the Physics of **Sports**.

**CONCLUSION:-** Biomechanics is the most important part of physical education and sports and playing a great role in this field. It helps a coach to give a proper training for athletes if we ignore the concept of biomechanics we can't give a proper training to athletes and their skills will not be improved.

## OVERVIEW

- Define biomechanics
- Benefits of proper biomechanics
- Applying biomechanics in teaching physical education
- Role of biomechanics
- Benefit from biomechanical analysis

## What is BIOMECHANICS?

It is the application of mechanical principles in the study of living organisms (Hall, 2007)

## BIOMECHANICS

The study and analysis of human movement patterns in sports (Bartlett, 2007)

**SPORTS BIOMECHANICS:-** It is a quantitative based study and analysis of professional athletes and **sports'** activities in general. It can simply be described as the Physics of **Sports**.

## ROLE OF BIOMECHANICS

Biomechanics can play a crucial role in both injury prevention as well as performance enhancement. It is important for athletes of all ages and skill levels to understand the importance of education to develop proper mechanics. Education can come in multiple forms, but with the emphasis on the visual learner in today's society, visual feedback is one of the most effective ways to modify an athlete's technique and allow them to perform at the most efficient level possible. An athlete's ability to perform efficiently and injury free are two key features in performance outcome and can both be improved with Biomechanical analysis.

## BENEFIT FROM BIOMECHANICAL ANALYSIS

Biomechanical analysis can benefit athletes of all ages and skill levels. Whether you are a weekend runner or a high performance sprinter, biomechanical analysis can be beneficial to you as it will allow you the opportunity to develop more efficient movement patterns. This can benefit the weekend runner by allowing them to increase their distance and run pain free, while the high performance sprinter can benefit from a more efficient running stride and allow them to shave milliseconds off their personal best time.

## INTRODUCTION

In sport and exercise, biomechanics refers to the study of human movements, including the interaction between the athlete, sport equipment and the exercise environment. Athletes are always trying to find ways to get faster, higher and stronger with minimal injuries. Improving your biomechanics may be one important way of enhancing your athletic performance, minimizing injuries and in turn, promoting career longevity.

In the example of baseball, understanding the proper biomechanics of pitching is one of the critical factors in establishing whether a pitcher is major or minor league material. Of course, there are other parameters used to measure a person's ability to pitch in the majors, but having proper form and good technique helps. Having a potent fastball, a deceptive change up and a wicked curveball must be learned - therefore, developing the right mechanics early on to deliver these pitches makes a big difference. A pitcher must also consider his health relative to his chosen art. Throwing a 160km fastball is an incredible feat, but one that is very hard on your body over time.

Learning proper mechanics to throw a fastball, beginning with the wind-up stage and culminating with the follow through stage, is crucial to staying injury free. In addition, developing effective secondary and tertiary pitches can minimize the beating your body takes by diversifying your pitching repertoire, and keeping the fastball pitch counts down. For young pitchers, mastering the proper biomechanics of body movement can go a long way in minimizing the chances of getting injured. The less injury prone a pitcher is, the greater the chances of developing into a major leaguer.



In the case of running, having the proper biomechanics can help improve your running economy by making the runner more efficient since they are using less energy. It also helps minimize imbalances and overuse injuries. The less time you spend on the sideline and more on training and competing the better chances of developing long-term.

Understanding proper sport and exercise movements will allow the participant to be more efficient, technically sound and prone to good habits for long-term development. An athlete who incorporates proper biomechanics ensures that he or she minimizes the risk of becoming injured, enabling them to pursue their potential to its highest level.

## BENEFITS OF PROPER BIOMECHANICS

- Develops efficient movement patterns whether on the field of play or during resistance training
- It helps in analyzing the sports performance. Data of performance is collected by different biomechanical techniques as cinematography, myography and analyzed.
- It helps in selection and adoption of techniques. It help for deciding the technique on the basis of human structure and its possible movement for the best result in sports.
- It helps in discovering the technique for the use of new equipments.
- It gives technical knowledge of technical mistakes.
- It helps in differentiating competition and training exercises.
- Physical ability can be developed with its help.
- It helps in generalising the solution of biomechanical problems.
- Improves sport-specific technique and form to enhance performance and minimize injury.
- Develops proper habits, ensuring that the athlete is able to develop in the long term.
- To help students improve their performance in sports, dance, and other physical activities.

- To reduce the risk of injury.
- To understand the human body.
- To know how internal and external forces affect movement.
- To improve techniques and equipment.
- To promote safety.
- To improve teaching and learning processes.
- To cater students with special needs.

**PE teachers, coaches, and athletes are “biomechanists” but they think of biomechanics unconsciously.**

#### **Tasks of P.E. Teachers & Coaches**

- ❖ Observe movement patterns of students or athletes during an execution of a skill.
- ❖ Correct errors and give feedback.
- ❖ Help students or athletes identify how a technique becomes effective.

#### **CONCLUSION**

At the end we found that biomechanics is the most important part of physical education and sports and playing a great role in this field. It helps a coach to give a proper training for athletes if we ignore the concept of biomechanics we can't give a proper training to athletes and their skills will not be improved.

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