

NBD in Brazil: Why have we embraced the task of raising student awareness about biomechanics?

Inaê de Oliveira¹, Marcos R Kunzler¹, Milena A dos Santos², Felipe P Carpes¹

¹ Applied Neuromechanics Research Group, Federal University of Pampa, Uruguaiana, RS, Brazil

² Department of Clinical and Experimental Sciences, Università degli Studi di Brescia, Brescia, Italy

Email: inaeoliveira.aluno@unipampa.edu.br

Summary

National Biomechanics Day (NBD) is a global initiative that was originated in the USA. Since its first edition, Brazilian institutions have actively embraced its goals, making Brazil a leading country in promoting biomechanics among high school students. This study explores the key factors driving this engagement, its impact on students, and the development of biomechanics in Brazil.

Introduction

High school students are exposed to concepts they can later see applied in daily life, including physics, mathematics, and biology examples. In biomechanics, many of these principles are fundamental to studying human movement. National Biomechanics Day (NBD) is a global celebration of biomechanics in its various forms, aimed at high school students and teachers [1]. In Brazil, NBD has become an integral part of numerous outreach initiatives across different universities, with a steady increase in the number of institutions participating each year. This study reflects on the key factors driving this growing interest and examines the impact observed over the past eight years of NBD events in the country.

Methods

In 2017, the Applied Neuromechanics Group from the Federal University of Pampa pioneered the first NBD event in Brazil. Over the years, these events have been consistently organized by graduate students, targeting high school students from local public institutions. The event is composed of a single-day activity, with morning and afternoon sessions showcasing biomechanics. A typical event begins with a brief introductory talk about the NBD mission, followed by an explanation of the day's activities. High school students are then free to explore five to six different stations, where various biomechanics concepts are demonstrated through short talks by graduate students and hands-on measurement demonstrations. Research results developed at the university are also used to exemplify the concepts and applications of biomechanics in professional careers. The selected concepts usually focus on sports biomechanics and clinical applications. In some years, a visit to the research laboratory was also organized for smaller groups of students. However, this visit is not always feasible due to transportation limitations to the university campus.

Results and Discussion

From the first edition (Figure 1A) to the more recent ones (Figure 1B and 1C) our NBD events have engaged around 600 students from the last year of high school, which is

significant considering the total number of students in the public school system in the city. The growing interest of schools in hosting NBD events in Brazil may have an additional explanation. In recent years, with NBD as a global event, high school education guidelines in Brazil have changed. Today, in addition to traditional high school studies, students participate in thematic activities to complement their core curriculum. One of these thematic activities includes the concepts of biomechanics. We argue that this shift is a key factor driving engagement, for both high school students and university students involved in organizing NBD activities. Additionally, the grant program from The Biomechanics Initiative plays a crucial role, as it provides funding for students to develop NBD events and supports their participation in conferences where they can present the outcomes of their initiatives.



Figure 1: NBDs in 2017 (A), 2022 (B), and 2023 (C). Visits to the laboratory and activities at a local public school.

Conclusions

NBD has proven to be an effective strategy for raising awareness about biomechanics among high school students and serves as a platform for graduate students to gain outreach experience and broaden their perceptions of a career in biomechanics.

References

- [1] DeVita P. Why National Biomechanics Day? (2018). *J Biomech.* **71**: 71:1-3.