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SCIENCE AND METHOD: METHODOLOGY OF SCIENTIFIC RESEARCH IN SPORT

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Abstracts: The monograph titled „Science and Method: Methodology of Scientific Research in Sport“, authored by Dejan Dasić, presents an in-depth analysis of the foundations of a scientific approach within the context of sports sciences. This manuscript examines the essential elements of any scientific research, regardless of the discipline in which it is conducted—ranging from the planning of research and the development of a scientific design to the selection of methodological approaches, data collection, and analysis. Published in 2023 by the Faculty of Sport at „Union University Nikola Tesla“ (Belgrade), this work serves as a valuable resource for researchers focused on phenomena and processes in the fields of sports and physical education.

Keywords: methodology, sports sciences, research process, interdisciplinarity, research planning and organization

1. Introduction

Science, as a dynamic and comprehensive field of human knowledge, has undergone significant transformations over the centuries. Its development has been marked not only by discoveries that radically altered our understanding of the world but also by changes in approaches, methods, and objectives dictated by contemporary conditions. One characteristic of modern societies is that science is no longer confined to laboratory research or theoretical debates within academic circles; on the contrary, it is increasingly interdisciplinary, global, and oriented towards practical issues. The influence of science is felt in all areas of social life—from medicine and ecology to economics and education—opening up numerous new opportunities as well as challenges (Vuković & Dašić, 2024; Dašić et al., 2024).

In the first chapter of the monograph „Science and Method: Methodology of Scientific Research in Sport," the essence of science is presented, along with its relationship to knowledge (Dašić, 2023a). The author elaborates on the role of science in the development of society and sports, emphasizing how sports institutions are becoming centers of knowledge and innovation. Special attention is given to the trends of digital transformation in sports, which is a key aspect of the modern sports system. Through a discussion of the characteristics of scientists in sports, this chapter provides deeper insight into the responsibility and significance of researchers in this field. Thanks to a detailed analysis of the concepts and postulates of science, readers are given the opportunity to gain insight into the issues of systematicity, objectivity, and precision in scientific knowledge. Some space is also dedicated to considering the relationship between science and other systems of ideas, including ethics, politics, art, and religion, contributing to an understanding of the complexity of their interactions (Dašić et al., 2023).

The author of this monographic work, after defining the concept of science, analyzes its basic elements, objectives, and tasks. At the center of the analysis are the postulates of science, such as objectivity, systematicity, precision, and organization of scientific knowledge, which provide a methodological framework for further consideration.

2. Methodology and Method

Methodology and methods are fundamental elements of any scientific research, regardless of the discipline in which the research is conducted. While methodology refers to the theoretical framework guiding the research and determining the approach to be used, methods represent the specific techniques and procedures for collecting and analyzing data. In modern science, appropriate methodology and well-chosen methods are crucial for ensuring the validity, reliability, and reproducibility of research.

The second chapter is dedicated to the methodology of scientific research. It primarily focuses on defining the concepts of methodology and the scientific method. The author details the structure of scientific knowledge, explaining key concepts such as scientific laws, hypotheses, and theories, and discusses the various levels of scientific knowledge. A noteworthy section addresses the transfer of scientific knowledge and its different forms, such as scientific explanation and prediction. The author engages with a wide range of scientific viewpoints and their practical applications, using examples like the Delphi method in a sports context.

Methodology involves a systematic plan that researchers use to address a research question or hypothesis. It encompasses the choice between qualitative and quantitative approaches, as well as the combination of both within the framework of mixed research. Thus, methodology provides a framework for research, guiding researchers in selecting the methods most appropriate for addressing specific research problems.

The author also reflects on various types of scientific views, explaining concepts such as facts, definitions, axioms, and theorems. The second chapter provides readers with foundational tools for understanding the functioning of scientific research in practice, paying special attention to the verification and falsification of scientific views, which is crucial for the development and confirmation of scientific theories.

Methods, on the other hand, include the specific techniques applied within the research process. These may involve data collection techniques such as surveys, interviews, experiments, or observations, as well as various methods of statistical analysis. Well-chosen methods enable researchers to obtain relevant data and draw valid conclusions. The choice of method depends on the nature of the research problem, as well as the type of data necessary to find answers to the research question.

In contemporary scientific research, the choice of methodology and methods depends not only on the research objectives but also on the technological and social conditions that shape the scientific community. Advances in technology, such as the use of artificial intelligence in analyzing large data sets, allow for new research methods that were previously impractical. These innovative trends influence how methodology and methods are applied across various disciplines, contributing to the improvement of scientific practices (Creswell & Creswell, 2023; Kovačević & Dašić, 2023).

3. Research Planning

Research planning is a crucial phase in the scientific process that allows for the systematic and organized execution of research. This phase includes defining research objectives, formulating hypotheses, selecting methodologies, and establishing the timeline and resources needed for the successful implementation of the study. Without adequate planning, research can become chaotic, insufficiently focused, and ultimately unsuccessful in providing relevant results.

The third chapter addresses research planning, describing the research process, the stages researchers go through, and the types of research applied in sports sciences. It offers an overview of general and specific scientific methods, ranging from analysis and synthesis to deduction, abstraction, and concretization. The author emphasizes the importance of selecting the appropriate research method and points out how crucial it is to adapt the methodological approach to the specifics of the research problem. Furthermore, the author explains various techniques of scientific research work, including surveys, interviews, measures, and tests. These methods and techniques provide concrete guidelines for researchers to effectively collect data and process it in a manner that meets scientific standards.

Research planning involves a series of steps designed to ensure that the research process is reliable and reproducible. The first step is identifying the research problem or question to be investigated. This step requires an in-depth analysis of existing literature to understand prior studies and identify gaps in knowledge that new research can fill. The next step is choosing the appropriate methodological approaches and methods

that will enable the collection of relevant data and its analysis. During the planning process, researchers must consider all available resources, taking into account human and material capacities as well as the timeline to ensure that the study is conducted within the expected timeframe.

Thorough research planning not only contributes to the quality of scientific work but also reduces the risks associated with potential problems that may arise during the research process. It also facilitates better management of research teams and resources, which is especially important in large multidisciplinary studies. Contemporary trends in science emphasize the importance of applying strategic plans in research, which also pertains to the use of advanced technologies and big data analytics, further complicating the planning process.

Research planning is an indispensable step that ensures scientific rigor, transparency, and validity; it contributes to the successful achievement of research objectives and the quality of final results (Gray, 2023).

4. Draft of the Research Concept

A well-designed research outline enables researchers to systematically approach the resolution of research problems. This significantly reduces the likelihood of errors and enhances the credibility of the obtained results (Flick, 2018; Creswell & Creswell, 2017). The outline also provides a transparent framework for all stakeholders who wish to understand and possibly replicate the research, contributing to the validity and reliability of the scientific work (Thomas et al., 2015).

In sports sciences, a research design might include an experiment testing the impact of various training programs on athletes' physical fitness. In such a case, the researcher defines groups of athletes, measures their initial fitness levels, applies different training programs, and ultimately compares the results to conclude which program is the most effective.

The fourth chapter of the monograph focuses on defining research problems and scientifically shaping the research process. The author discusses the significance of previous research, offers explanations related to formulating hypotheses, identifies variables and indicators, and considers both scientific and social research objectives. This chapter details

how to formulate the research problem both theoretically and operationally.

The author provides guidelines for establishing the scientific and social justification for the research, emphasizing the importance of both scientific and societal contributions. This chapter is particularly useful for researchers at the beginning of their studies, as it offers practical advice for creating research outlines and directs them toward understanding the complexities of scientific work.

5. Science and Sports

Chapter five examines the relationship between science and sports. This section introduces readers to the fundamental principles of sports sciences, with a particular focus on the historical development of kinesiology. The author analyzes the social and individual roles of sports through various conceptual frameworks, including humanistic, classicist, national-political, and utilitarian-economic perspectives.

Following this, the chapter explores the role of science in sports deve-lopment, considering innovations and technologies used to enhance athletic performance and proper nutrition. The chapter concludes with a discussion on data processing and statistical analysis in sports, highlighting the importance of using software tools for data analysis, which is crucial for modern scientific approaches in sports research.

The methodology of scientific research forms the foundation for a successful and valid research process across all scientific disciplines, including sports science. As a complex and multidimensional field, sports encompasses various aspects that can be analyzed from a scientific standpoint—ranging from physiological and biomechanical to psychological, sociological, and economic factors. In this context, applying systematic research methods and procedures is essential for understanding, developing, and improving sports in contemporary society.

The aim of methodology in scientific research within sports is to ensure a structured, objective, and reliable approach to collecting, analyzing, and interpreting data. A sports researcher must be able to select an appropriate methodology that fits the specific research problem, whether it involves investigating athlete performance, the impact of different training methods, or psychological

factors affecting success in sports (Dašić, 2023b). The biographical method in sports sciences provides valuable insights into individual and group athletic performances by analyzing the personal and professional trajectories of athletes. This approach enables researchers to understand how factors such as socio-economic status, psychological aspects, and key developmental moments influence an athlete's success and motivation (Holt et al., 2010). Additionally, the biographical method allows for the collection of qualitative data that can enrich quantitative analyses and provide a deeper understanding of sports phenomena.

The choice of appropriate research methods—whether qualitative or quantitative—determines not only the direction of the research but also the credibility of the results obtained. Modern sports sciences increasingly rely on an interdisciplinary approach to research, connecting various scientific disciplines such as medicine, psychology, biomechanics, pedagogy, and sociology. This not only provides insights into the physical and cognitive capabilities of individuals but also into the social and cultural factors influencing athletic performance.

As technology plays an increasingly significant role in sports, the importance of scientific methodology becomes even more apparent. Advanced statistical software, performance tracking and analysis technologies, as well as the use of large databases, enable more comprehensive and precise analyses, allowing researchers to draw scientifically grounded conclusions.

6. Organization of Scientific Research

Scientific research plays a key role in the development of knowledge and addressing practical problems across various fields, including medicine, engineering, social sciences, sports, and many others. The organization of research involves a comprehensive process that includes planning, conducting, analyzing, and reporting research findings. In this context, good organization is essential for ensuring scientific rigor, data validity, and ethical approaches (Saunders et al., 2019).

Organizing scientific research requires effective management of resources such as human capital, time, and financial resources. Clear communication among research team members and other stakeholders—primarily institutions, funders, and the broader scientific community—is

also necessary. Good organization implies a systematic approach to data collection and processing, ensuring reliable and reproducible results.

Chapter six focuses in detail on the organization of scientific research. It outlines guidelines for the preparation and drafting of scientific papers. The author analyzes the process of topic selection, the gathering of relevant literature and sources, and the formulation of titles and structures for the work. This part of the book provides practical advice for those planning to write scientific papers, emphasizing the importance of clear structure and systematic writing.

The most attention is given to the introductory and main sections of a scientific paper. The author highlights the significance of properly shaping introductory elements such as titles, abstracts, and acknowledgements, and offers suggestions on how to formulate content to convey information clearly and precisely.

In sports sciences, for instance, organizing research often involves collaboration between sports coaches, medical professionals, and scientists in the fields of biomechanics and physiology. (Dašić, 2023c; Vuković, et al, 2023). Well-organized studies can lead to significant discoveries in injury prevention, performance enhancement, and training optimization.

Conclusion

The monograph *„Science and Method: Methodology of Scientific Research Work in Sport"* presents a detailed and systematic overview of the methodological principles and practices essential for understanding scientific research in the field of sports. The author, Dejan Dašić, successfully combines a theoretical framework with practical examples, offering readers valuable guidelines for conducting research in sports sciences.

This book is an exceptionally useful resource for students, researchers, and scientists involved in sports sciences. It is also beneficial for those seeking comprehensive knowledge about methodology and scientific approaches to research. The wide range of topics covered, such as research planning, methodology, statistical data processing, and the role of science in sports, makes this monograph relevant for investigating various aspects of contemporary sports.

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NAUKA I METOD: METODOLOGIJA NAUČNOG ISTRAŽIVANJA U SPORTU

Sažetak: Monografija pod nazivom „Nauka i metod: metodologija naučnog istraživanja u sportu“, autora Dejana Dašića, predstavlja dubinsku analizu osnova naučnog pristupa u kontekstu sportskih nauka. Ovaj rukopis ispituje bitne elemente svakog naučnog istraživanja, bez obzira na disciplinu u kojoj se sprovodi – od planiranja istraživanja i razvoja naučnog dizajna do odabira metodoloških pristupa, prikupljanja podataka i analize. Izdato 2023. godine od strane Fakulteta za sport Univerziteta Union „Nikola Tesla“ (Beograd), ovaj rad služi kao dragocen resurs za istraživače fokusirane na pojave i procese u oblastima sporta i fizičkog vaspitanja.

Ključne reči: metodologija, sportske nauke, istraživački proces, interdisciplinarnost, planiranje i organizacija istraživanja