

**Review Paper**

**THE EDUCATIONAL ASPECTS OF THE "EASY" AND  
"DIFFICULT" PROBLEMS IN SPORT TRAINING**

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**Abstract.** *Knowledge and self – knowledge regarding movement capability and self – movement in sport is the requirement of current users of training in sport. Human movement and self – movement make up the basis of human life. In sport science, mobility is examined in special training conditions and competitions. With their bodies, movements and self – movement athletes achieve results in sport, which become a particular essence in life. This paper was written with the purpose to emphasize the qualitative and quantitative essence of sport anthropomotorics and self – movement and to point to the possibility of learning facts about qualitative and quantitative movement and self – movement, formed by training as a separate form and essence of modern education. Two groups of problems are indicated by emphasizing the essence of education in sport pedagogy for the purpose of the systematization of knowledge. The first group includes the "easy" problems of realization which mainly refer to the material aspect of a sport body, the environment and movement and the other group ("difficult" problems) refer to the realization of the conscious, the unconscious, experience i.e. the qualitative aspect of the anthropomotorics of athletes (sport movement and self – movement) and a sport action.*

**Key words:** *sport training, sport anthropomotorics, sport achievement, "easy" problems related to obtaining knowledge, "difficult" problems related to obtaining knowledge.*

INTRODUCTION

One of the key factors of sport pedagogy is knowledge. The basic function of knowledge in training is to connect the subjects in sport. The connective function of knowledge is particularly noticeable during competitions. In the theory and practice of modern training the importance of knowledge of sport anthropomotorics as a dominant factor for

connecting a coach with the athletes is overrated. The basic requirement of understanding sport anthropomotorics is the understanding of human movements i.e. movements as "a life form" (Sheets – Johnstone, 1999, 21) which are noticeable in sport. However, for appropriate communication among the subjects in sport, other kinds of knowledge are necessary.

The essence of training can be explained by the occurrence of a balance between all the various forms of knowledge that exist between a coach and an athlete, not only the anthropomotoric ones. Considering the part that knowledge plays in the culture of a human society, knowledge of sport has to do with all the subjects in sport. Sport training is a factor of modern education, by means of which it is connected to the concept of culture (Gadamer, 1978, 36).

A sport action is the key sport event and is the occurrence and the process in which the characteristic sport relationship among all the subjects in a sport is established: the coach, the athlete, the spectator, the sponsor and others (Kostić & Kostić, 1997, 16). It is also characterized by the elements of virtuosity along with the necessity of performing a special sport technique (Howard).

The knowledge of human movement was in the main point of attention in all of the epochs of civilization. The ancient Greeks were particularly interested in movement capabilities and expressed their interest by using gymnastics as a part of education (paideie). According to Plato (2002, 259) children were taught about movement by specially trained teachers (paedotribes).

A modern coach dominates the function in the process of distributing knowledge of sport, so he has to master the knowledge of various fields of life. The knowledge of a coach should include the knowledge of the different phenomena of life: a knowledge of content, general pedagogical knowledge, a knowledge of planning, a knowledge of the pedagogical aspect of training, knowledge of the students, the environment and the knowledge of training results, aim and values (Schempp, 1943).

The purpose of this paper is to emphasize the importance and the special nature of sport education and self – education, by means of which the qualitative and quantitative elements of movement and self – movement develop under the influence of training, competition and sport action.

## 2. THEORETICAL ASPECTS OF THE PROBLEMS

### 2.1 Sport movement as an existential phenomenon

One of the basic phenomena of human existence is movement. It differs from the movement of other living creatures. That is why the movement of athletes is called "sport anthropomotorics" in sport science (Kostić, 2000). The knowledge of sport anthropomotorics (movements in sport) is the fundamental content of sport education. Movements in sport are created on the basis of anthropomotorics, but they differ from it on the basis of their structural elements. The practical and theoretical knowledge of the structures of movement is special and is acquired by means of special sport education. **The special knowledge of sport anthropomotorics and skills is dominant over any specific knowledge.** The existence of sport knowledge enabled the development of sport pedagogy as a special branch. In regards to the basic subjects, sport pedagogy is dominated by

the characteristic knowledge of the coach, the athletes, the parents, spectators and experts in different areas.

Sport movement is a special form of human existence in a special sport environment. When a volleyball coach hits a ball towards a player in different ways, it seems that the relationship between them is established by the physical elements of the flight of the ball (the acceleration, time, distance, trajectory and other elements) and the elements of the environment (the height of the net, the size of the field, the height the ball reached, the height of the player's position and other material elements of the environment). To a bystander, providing the minimum of material elements of the environment seems enough to have a successful training session. But that is just the way it seems. In fact, the essence of the relation between a coach and a player is their knowledge of movement.



Fig. 1. "Shooting" in volleyball

The coach uses various different ways in which to throw the ball to the volleyball player, and the player has to make use of his knowledge of technique to change the trajectory of the ball, and so solve the problem of the volleyball way of moving. In the movements characteristic of volleyball, the coach and the player use their knowledge at the same time, gain experience of volleyball movements and demonstrate a volleyball sport action. The basic condition under which a sport technique can represent the volleyball knowledge is for it to be used to create a volleyball sport action.

The basic elements of materialization in sport training are the bodies of a coach and an athlete, the equipment and objects (a ball in sport games). With their physical directness they point to the possibility of making a connection among different levels of knowledge. Training, as a special form of movement, reveals the basic qualitative structures of movement which have to do with force or strength, space and time (Sheets – Johnstone, 1999, 143). The qualitative structures of sport movements and their relations are manifested in a sport action (Kostić & Kostić, 1997, 17). To point out the qualitative elements of movements in a sport action, in sport, the term "poesis" appears to be more adequate than the term "praxis" (Bordlo, 2003). That is how the relations among material

factors, psychological and rational phenomena are established by means of a sport action. A sport action appears to be a unique whole made up of the following components:

- sport movement in the sense of various techniques,
- body materialization (e.g. body weight and height),
- contents of the environment,
- the particular relations among the subjects' knowledge involved in a sport action (the coach, the athlete, the audience and all the other participants in the sport action in some social group),
- the psyche,
- social and cultural components,
- rational components.

## **2.2 Classification of anthropomotoric knowledge**

The knowledge of human movements in sport or, in other words, the knowledge of human anthropomotorics applied in sport takes the central place in sport pedagogy. Anthropomotoric knowledge is related to various movement occurrences and phenomena. The basic function of knowledge is to explain, understand and predict the future movements of athletes and non-athletes.

The modern theory of anthropomotorics (Kostić, 2000) recommends the following classification:

1. knowledge of basic anthropomotorics (ontological),
2. knowledge of active anthropomotorics,
3. knowledge of the anthropomotorics of health,
4. knowledge of artistic anthropomotorics,
5. knowledge of sport anthropomotorics,
6. knowledge of anthropomotorics of the cosmos etc.

The suggested classification reflects the existential conditions of modern man and the phenomenon of movement in real life. These groups represent a logical connection of knowledge, which emphasizes the wholeness and uniqueness of a concrete type of knowledge and an awareness of it (Wilber, 1997).

The knowledge of sport anthropomotorics, as a unity of special types of knowledge, is acquired in a special sport environment and activities, so it differs from the other types of knowledge and can be considered the knowledge of sport movement in which the qualitative and the quantitative elements of strength, speed, endurance, coordination, balance, etc. are recognized.

Defined in this way, the special types of knowledge of sport anthropomotorics in a particular sport make a separate whole consisting of the necessary knowledge of sport. For the requirements of sport education within sport pedagogy and research, knowledge of sport can be systematized into various groups of knowledge and self – knowledge:

1. the sport body,
2. the specific and unique nature of sport,
3. the psyche,
4. social relations,
5. the ways of learning,
6. the environment,

7. health,
8. training,
9. competition,
10. movement and self – movement.

The sport subjects do not have equal knowledge of all the aspects that are researched and learned in sport. In modern day sport, the coaches are the subjects who should master **the dominant knowledge of movement in sport** in relation to the other subjects (the athletes, the audience, the sponsors, the experts, etc.).

However, every subject in sport learns and reveals to a certain extent any special knowledge, its usefulness and social value. The problems related to the knowledge of sport depend on the essence or the nature of sport knowledge. The nature of sport knowledge is expressed by means of facts. In sport, two groups of facts are dominant:

- a) the first group is refers to the material nature of the subjects and the environment
- b) the second one refers to the psyche and the rationality of the subjects.

In connection with knowledge and self knowledge of the facts about training and other forms of knowledge, the facts can, under certain conditions, be divided into two groups: the "easy" and the "difficult", on the basis of whether they refer to the qualitative or the quantitative structures of a sport action.

### 2.3 Knowledge and self – knowledge of material facts – "easy" problems



Fig. 2. A training session in volleyball

The essence of sport movement determines the character of education and self – education in sport. It would be incorrect to emphasize the training methods and behaviour as the important factors in sport education (compare: Gadamer, 1978, 43). The methods of acquiring knowledge as well as the methods of the learning process are determined on the basis of the nature of the sport knowledge, and that nature is movement. The investigation of knowledge in sports has to start from movement "we have to start our research

with movement" (Aristotle, according to Sheets – Johnstone, 1999, 3). The global division of sport knowledge distinguishes between the knowledge of the characteristic aspect of sport movement and the material, psychological and rational nature of sport. The human capacity to obtain knowledge is still in development, so these particular areas have still not been investigated equally. The facts which have been explained the most and have been understood are found in the material sphere of sport. They gave the starting point for sport practice and theory. The fact of materialization is revealed by the application of scientific, analytic and synthetic methods.

The first example of a functional and systematic analysis in determining the facts about the materialization of the movements of children and youths was given by the research of morphological and motor dimensions of young people aged from 11 to 17 in SFRJ (Kurelić, Momirović, Stojanović, Šturm, et al., 1975, 147 – 158). The results of this research gave some important numerical information to be studied, and the possibility of interpreting numerical results and making conclusions. The general growth factor was established, which in the male population was reduced to two taxonomic groups (skeleton growth and subcutaneous fat tissue), latent dimensions (longitudinal, transversal, circulatory, subcutaneous, skinfold and body mass). The function and movement regulation was defined and explained in the analyses of motor space starting from the mechanisms that regulate human movement. Two, so to speak, general factors were nominated (the mechanism for central movement regulation and the mechanism for energetic regulation). The knowledge of the basic factors of children's growth and development and the relations between morphological and motorical dimensions were obtained in this research. They served as a starting point for skilled education of trainers and pedagogues of physical education and have been used to this day.

**The reductive approach in the interpretation of human movement in sport and other forms of movement is often used in movement research in sport.** The acquired knowledge of anthropologic space is used to make different assumptions, the acceptance or rejection of which helped to determine the facts of the movement uniqueness in sport and other life situations.

The knowledge obtained by applying the reductive methods had numeric information as its basis. **On the basis of the mathematical and logical model of learning, human movement is reduced to factors, dimensions, space, structures, mechanisms and the relations among them.** The basic physical characteristic of the facts about movement served as the basis for obtaining mathematical information, so that the research and the assessment of the development of children and athletes were reduced to the numerical indices.

Knowledge which can be used and applied in the methods of development of sport and non – sport movement was established by the results of research carried out in the natural sciences (physics, biology and others). The materialistic approach in studying the nature of movement provides the knowledge of many materialistic relations of the material in sport and in movement. The knowledge that was used to start with was about how to develop a sensations to a stimuli from an outer or inner environment, about the quantitative physical measurements of movement, the physical characteristics of the stimuli, the physical characteristics of the sport equipment and objects, the chemical structure of substances which are taken orally, the enzyme structure, gene structure etc. The scientific methods enabled progress in obtaining facts and information about movement in sport. This knowledge enabled the achievement of new areas in sport results. **However, this**

**approach did not enable, at the same time and to a necessary extent, the knowledge of the quality of the sensations, the perception or the fact in regards to the sport action.**

It was obvious that merely knowing the facts was not enough. The examples showing the use of stimulants demonstrated that they change the structures and the mechanisms of movement regulation. Their use permanently changes the structure and the mechanisms of movement **and those changes are not humane.**

Education and self – education about the contents of physical strain and the reactions of the body of an athlete influenced sport achievements (acts). However, the bunch of facts did not resolve the problems of obtaining knowledge, especially the understanding **of all the aspects of human movements in sport, e.g. the concept of sport experience and awareness.**

#### **2.4 Education and self – education about sports movements as a "difficult" problem**

The knowledge of the nature (essence) of natural and social studies improved the development of the structural and functional approach in the research of movement. However, this knowledge could not explain what happened inside an organic structure, the functioning of the organs and the mechanisms that "regulated" the movements. The understanding of human nature on the basis of facts and information was sufficient to separate the knowledge that was obtained in an obvious, empirical and understandable way. Such knowledge is available to most people and athletes and has to do with solving "the easy" problems in sport. This knowledge ends **at the level for determining and locating the centers in the cerebrum, in the CNS.** Experience in the field of medicine has pointed that damage caused to the mechanism for movement regulation by physical destruction or damage of some of the regions of the brain leads to occurrence of the problems that are "difficult" to explain when it comes to movement and, therefore, sport movement as well.

One of "the difficult" problems is the feeling **of the quality of movement** or the technique that is performed. It is known that the condition of being trained can be monitored by measuring the difference between trained athletes and people who have not been in training, and the difference among athletes who have not been training equally. Science has not given the answers to the questions such as when training becomes sport fitness, where the center for sport fitness is located, how to predict which runner will win in 100 m race, how to determine training qualities, in what way the conscious and unconscious states affect the changes in the training conditions, sport fitness, and the achievement of a sport action, etc.

The second problem is the achievement of aesthetic beauty and many sport disciplines emphasize **the aesthetic and the artistic facts.** In the "bare" fact of a long jump some people recognize the beauty of sport; others recognize beauty in handball or basketball.

The occurrence of sleep and the unconscious in sport is the frequent subject of study in some scientific disciplines. The problem of being awake is one of "the easy" problems in sports. Only the athletes who are awake can train and compete. However, the result of modern research shows that particular abilities can develop during sleep as well, that the state of being under hypnosis excludes the state of being conscious, but does not exclude the possibility of the hypnotized athletes moving, etc.

**The moral** norms in training and during competitions are an important sport dimension. Modern sport is full of codices which regulate the behaviour and movements of all the subjects involved in sport in terms of limiting the inhumane or animal – like forms of behaviour. We know the codices for athletes, parents, trainers, experts, managers, the audience, the media experts, etc. (Codes of Conduct for Building Character Through Sports).

Among "the difficult" problems in sport it is important to single out those which explain, use and develop knowledge and behaviour related to love towards sport, the integration of information about movement and training, collectivity, memorizing the anthropomotoric stereotypes of movements, the conditions of thermodynamics and anthropomechanics (statics, dynamics), the biochemistry of life and other phenomena in sport.

The most interesting and most "difficult" problem is connected with gaining knowledge of an **athlete's creativity**. The question is how the process of the transformation of the knowledge of the facts about the material nature of training and the body into the facts of the awareness of a new technique or a new training method takes place inside the body of an athlete. The system of analysis based on reduction and the explanation of the structure of the muscular and other systems in an athlete's body, and the functions of these structures (mechanisms) end with the facts about the material nature of the brain. By determining these facts we come to **"a black hole" in the scientific knowledge of how the facts of experience, consciousness and especially the consciousness regarding the creative components in sport come to be.**

The most interesting and "the most difficult" problem of education and self – education in sport is related to **the sport experience**. In every sport every subject has a special experience. A spectator is one of the subjects in sport characterized by many experiences in regards to assessing the sport action, on which his decision which competition to watch will depend.

On the basis of some indices of movement quality, that is, sport knowledge and skill, an experienced sportist can be distinguished from an inexperienced one. Modern science could not determine where this experience is kept in the brain and to what extent it was connected with any other training qualities (Hardcastle, 1996). Another form of the frequently mentioned experience in sport is the experience of the coach. The content of his experience differs from the experience of the competitors, although it is a tendency of the education of a coach that he has previous experience as a competitor. It is interesting how relations between the experiences of the coaches and the competitors are created. Some sport results were achieved solely by the interaction between these experiences. It is a fact that coaches change clubs, and that athletes are not as successful when working with some coaches as with others.

One of the most "difficult" scientific questions is how to bridge the gap between substance (nerve cells) and consciousness i.e. their ability to function. It is true that the state of consciousness needs the nervous system, that the nervous system functions regardless of the fact whether we are awake or not, but the mechanism of how an immaterial awareness of movement is created in a material cell has not yet been discovered. (Steiler, 1996; Sutherland, 2001).





Fig. 3. Transmitting knowledge and experience during a "time out"

Any kind of knowledge, even of awareness can be transmitted by **speech**. Words appear as speech elements and they are organized in different ways. A word is a concept that can be shown by mechanical facts. The content of consciousness is given in words. It is important for the subjects in sport to form the words which can describe sport consciousness and the sport movements. Another problem is how, by means of words, as a means of communication, experience and knowledge can be transferred from the coach to the athlete and vice versa

The function of the game in training and in a competition is one of the more "difficult" problems regarding education and self – education in sport. A game is the "easy" method of learning but is a "difficult" one in the process of forming consciousness and experience. Just how much the game (*paidia*) was important can be seen in the interest that Plato (2002) showed for the game in his work "The Republic". Plato defined the game as a method of learning, and as an activity which refers to education (*paideia*). (Krentz, Morimichi)

The problems of gaining, keeping, evaluating and using knowledge of sport are related to the very essence of sport, i.e. sport movement. At least two types of knowledge can be identified:

1. about the natural material contents of sport, which belong to the group of sports knowledge which is considered "easier" and
2. about the experience and consciousness, which belong to the group of sport knowledge considered to be "difficult".

## CONCLUSION

It is important for the development of the sport action to solve "the easy" and "the difficult" problems in a synchronized and harmonized way. Sports knowledge can contribute to the humane development of movement if all "the easy" and "the difficult" problems about the nature of sport, the methods for obtaining knowledge about the essence of sport, the qualitative or the quantitative characteristics of the nature of movement in are discovered and solved.

In the "easy" contents of sport education and self-education, knowledge about the quantitative (material) aspects of the body in sport, the special and unique techniques, the psyche, social relations, the environment, health, training, competition and sport action are included. Quantitative parameters are usually learned with a functional approach and reductive methods (analysis -synthesis).

In the "difficult" problems of self-education and the education of athletes, qualitative knowledge which is related to the sense of quality in sport movement and self-movement, the role of the conscious and the unconscious, the discovery of the beautiful and of aesthetics, moral norms, integration, information on the collective, the process of remembering the forms of different anthropomotoric stereotypes, the quality of biochemical processes, the creativity of the athletes, the experience of the athlete and the coach, the qualitative side of speech and the quality of the game belong here. The methodology of the research of the "a difficult" qualitative problem is insufficiently explored in other scientific disciplines, as well in the disciplines of sport.

Sport action represents the key element in which all the discovered and undiscovered "easy" and "difficult" problems of sport knowledge and self-knowledge are expressed, and by means of which the quantitative and qualitative contents of the relationship of all the subjects in sport (the trainer, the athletes and all the others) are expressed.

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## OBRAZOVNI ASPEKTI "LAKIH" I "TEŠKIH" PROBLEMA U SPORTSKOM TRENINGU

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*Saznanje i samosaznanje sposobnosti kretanja i samokretanja u sportu je potreba savremenih korisnika treniranja u sportu. Ljudsko kretanje i samokretanje je osnova ljudskog života. U sportskoj nauci motorika se proučava u uslovima specijalnog procesa treniranja i takmičenja. Sportisti telom, kretanjem i samokretanjem stvaraju sportska dela kao posebnu životnu suštinu. Ovaj rad je sačinjen sa ciljem da se istakne kvalitativna i kvantitativna suština sportske antropomotorike i samokretanja i ukaže na mogućnosti saznavanja kvalitativnih i kvantitativnih činjenica o kretanju i samokretanju, koje je oblikovano treniranjem kao posebnom formom i suštinom savremenog obrazovanja. Isticanjem suštine obrazovanja u sportskoj pedagogiji radi sistematizacije znanja ukazano je na dve grupe problema. Prva grupa odnosi se na "lake" probleme saznanja koji se pretežno odnose na materijalnost sportskog tela, okoline i kretanja, a druga grupa ("teži" problemi) odnosi se na saznavnu stranu svesnog, nesvesnog, iskustva, tj. kvalitativne strane antropomotorike sportista (sportskog kretanja i samokretanja) i sportskog dela.*

Ključne reči: *sportski trening, sportska antropomotorika, sportsko delo, "laki" problemi saznanja, "teški" problemi saznanja*