

Current Issues in PE and Sports Research

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In this day and age no systematic, long-term human activity can succeed without taking advantage of research and the knowledge it provides. The same is true for sports and physical activity. The contemporary role of research and academic enquiry is accurately summed up in the motto of the Report on Research in the Czech Republic for 2007 that was put together by the National Council for Research and Development:

“Science turns money into knowledge, and innovations turn knowledge into money”

In the area of sport, where applied research dominates, the above motto should be modified as follows:

Research turns money into knowledge, and knowledge then influences sports performance.

The knowledge gained from research programmes directly reinforces experience gained through long-term training practice and sports performance and is not, as some individuals would have it, antithetical to it. The mutual relationship is shown in Chart 1.

Many practitioners in our world still argue that practical experience can substitute for knowledge gained from research studies. This idea is currently losing ground from at least two standpoints:

1. No coach is capable during training practice of experiencing all the situations that can influence sports achievement;
2. Constantly improving sports performance is decided at a cellular and sub-cellular level, the principles of which cannot be practically and, most particularly, effectively employed without the knowledge gained through research.

At the same time, we have to remember that even the best research results lose purpose if not applied in training practice, i.e. their practical ‘value’ or usefulness will always in some fundamental way be influenced by the coach, and the determining factor for success in his field will be his ability to use all available knowledge effectively.

To provide a better picture of the current situation of research in sports, we will summarise the basic conclusions found in the literature globally, and at the same time we will list the basic problems that frequently and widely limit research in sports in fundamental ways.

The first basic question is:

Where is the research carried out around the world?

On the basis of studies by Culver and colleagues (2003), Gilbert and Trudil (2004), Silverman and Skonie (1997), Ward and Barrett (2002), Williams and Kendall (2007) and other available sources, it has been shown that in English-speaking countries the majority of research is carried out in universities or in specialised research centres, i.e. in facilities that are well resourced in terms of personnel and materials, and are thus able to secure these programmes long-term and have appropriate experience.

What is being tested, and what is the object of the research?

Two-thirds of studies are carried out on a relatively small group of sports, and of these approximately 50% were on cycling, rowing, football, athletics and swimming. Research, therefore, is carried out on sports that have a sufficiently large base, are well known and popular, and have a media presence that makes it possible to assign part of their resources to targeted research activities.

What methods are being used?

The majority of research programmes have used and do use the findings and methods of physiology and medicine. This unfortunately is also true of the initiation of research studies, i.e. who assigns research tasks. A fundamentally smaller amount of research work is initiated within the training environment, and the weak spot remains social science research. Another fundamental factor is where the research takes place, whether under real training conditions or in the lab, and on 'whom' the research is carried out.

Available data in the literature show that approximately two-thirds of researches were carried out under laboratory conditions, in artificial situations where the transfer of results into the training experience is often limited. Another 'weak' point is that only around half the studies were conducted with peak performers or athletes. The rest were mostly carried out on students or paid volunteers, where the direct applicability of knowledge into the world of high-performance, where selected individuals are nurtured over long periods, is often limited.

The advantage of current sports research is that it is open to virtually all modern technology, of which it often takes advantage (e.g. Bloch 2007, Ward and Barrett 2002).

At one end of the scale people have great hopes for the use of genetic engineering to identify the preconditions for kinetic endurance, while at the other they are also trying to take advantage of new understanding gained from social studies.

Virtually all available studies used teams of experts from a range of disciplines, and ad hoc research teams were created that varied in *modi operandi* according to the research problem being attacked. In all successful researches the coach was part of the research team, and it was he who devised and verified the translation of the results into practice.

Data on research done in Europe as well as in the Czech Republic are not summarised in as much detail as in the above-mentioned studies, but the areas of research and the way it is performed are similar. The essential difference lies in the gap between the financing that is generally available to researchers in English-speaking countries and the resources that are common in Europe or even in the Czech Republic.

The basic problems of sports research can be summarised as follows:

- Definition of the problem – especially clear definition of the research task, its timeliness/topicality, etc.
- Lack of information sharing between the designer and the client – e.g. on the one hand, you have researchers who do not have the relevant information about the needs of the sports environment, and on the other, the ‘coaching public’ who do not have enough information about the potential of research;
- Often unrealistic ideas about the benefits of research on the one hand, and its underestimation on the other;
- ‘Adaptation’ of the research problem into a solvable task – in addition to the definition of the research problem, it must be expressed in a form of words which is meaningful to the researchers;
- Preparedness and experience of the research team;
- Preparedness and experience of the client of the research;
- Transformation – translation of research findings into training instructions. It is not enough to publish the research findings; it is necessary they be translated into usable instructions;
- Distortion of research results in their practical application – often there is distortion of the research results through inappropriate use, frequently in unsuitable conditions, or by application to ‘unprepared’ athletes, which ultimately results in degradation of the research;
- Mutual distrust between researchers and clients – often there is a suspicion that research exploits the sports environment to obtain suitable material for publication,

and conversely, that the sports environment only uses research findings to obtain benefits for the coach;

- Limited institutional support – top sports and state representation is highly effective advertising for any State; therefore, in addition to supporting the training process, the State should also contribute to securing the research programme;
- Low support of systematic research from private sources – private funds are often only used to authenticate products that are then sold into the sports environment;
- Rarely is there a long-term approach – only infrequently do we find a long-term plan that is the product of consensus between researchers and the sports world;
- The confidentiality of research results in sports – sometimes this means duplication of effort, because not all the results of research programmes for top athletes are published.

Depending on their focus, research programmes in the area of PE and sports can be divided into two categories:

1. Research into materials
2. Research into people.

Material research focuses on the research and development of new materials and technologies that affect sports performance. Many discontinuous advances in sports performance are to a substantial extent the result of progress made in the physical equipment of athletes. The classic example is the advent of laminates in the pole vault, new materials in swimming sports, etc.

Research programmes into people focuses primarily on:

1. Development of new training methods
2. Control and management of the training itself
3. Assessment of the effect of training effort
4. Identification and cultivation of sports talent
5. Proposals for physical interventions that offset the effects of current lifestyles and increase work efficiency and reliability
6. To accelerate and improve the quality of regeneration (as after the training exercise and after injury), also including the use of authorised means of support

It is possible for training process research results application to be illustrated schematically on a model of training process management; see Chart 2.

Because not all situations can be directly checked or implemented in practical terms, modelling. Either of personal achievement or its prognosis, is receiving a lot of attention in sports research. The forecasting exercise plays an essential role in the process of selection and cultivation of sporting talent, and in the verification of long-term exposure to training methods.

The one indispensable and basic form of successful research activity is teamwork, especially the direct research cooperation of researchers, clients and end-users of the results – trainers or methodologists. And it seems necessary for the coach to be a member of the research team.

Although primary responsibility for sports results, and therefore for the implementation of research results, obviously lies with the coach or trainer, you cannot take away the responsibility for the application of research results from the researchers. The contribution to sports results of both parties involved should be clearly defined, whether in the event of success or failure.

What is the current status of sports research in the Czech Republic?

The Czech Republic has a long tradition of research into sport. Unfortunately, in recent years its support and use have declined. Successful research programmes are mostly based on researchers' and trainers' personal contacts. There is no clear plan, nor any clear institutional support, which in recent years has been purely random, and not based on the long-term needs of the sports world or on the potential of the current research base. The result is an ever-diminishing supply of research resources, be they human or material. It is only possible in a very limited way to undertake long-term planning, and especially to train new workers who, upon completion of their PhDs for example, will leave the research environment.

Despite the many problems associated with ensuring the implementation of research programmes in the Czech Republic, sports research is being carried out, even if its support is largely from sources other than direct funding for research in the field of PE and sports.

At the present time the balance of research is carried out in facilities that have the tradition and the necessary material and especially personnel support. Research is primarily carried out by the biomedical, natural science and social science disciplines, and takes place primarily in academic facilities, but also in departmental sports centres.

Systematic research into PE and sports is run by universities (Faculty of Physical Education and Sport of Charles University in Prague, Faculty of Physical Culture of František Palacký University in Olomouc, and Faculty of Sports Studies of Masaryk University in Brno) and research centres of the Ministry of the Interior of the Czech Republic and Ministry of Defence of the Czech Republic (Czech Army Sport Research Institute).

Sub-issues are randomly dealt with by other university facilities (e.g. medical faculties, hospitals, some teaching and technology faculties), private entities (often with private money and aimed at the future sale of products), and certain 'clubs'.

The fundamental problem of current sports research is the funding and coordination of these activities. One result of insufficient funding is a decrease in real capacity for research work. It should be noted that the demise of facilities, and especially the loss of experienced researchers, is a practically irreversible process. Restoration of research programmes is an expensive and long-term process, often with very low efficacy.

Other factors limiting research into sports are some communication problems between researchers and research clients, and the cooperation of research centres.

Finally, although research into sport faces a number of problems primarily around its continued existence, it is still able to provide useful results. On the other hand, it is just a question of time before, without any defined support, it will be completely extinguished.

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