

The 3rd European Pole Vault Conference

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Cologne, Germany

Introduction

Sergey Bubka, the world record holder in the pole vault, and his long-time coach Vitaliy Petrov led an exceptionally strong international team of 19 presenters at the 3rd European Pole Vault Conference, in Cologne, Germany, from 25 to 27 April 2008. The conference attracted a record 250 participants – 120 German national team members, 60 other German coaches and athletes plus 70 international guests from 31 countries.

Hosted every other year by the German Sport University Cologne, this edition of the conference had the theme “On the road to Beijing”, in acknowledgement of the forthcoming Olympic Games to be staged in the Chinese capital. The conference programme included a mixture of general topics, event specific theory and practical presentations, using German national team members for demonstration, plus roundtable discussions and opportunities for the participants to interact directly with the speakers. As a special feature, a parallel programme on the high jump was added to the conference for this first time this year.

Plenary sessions took place in the main lecture theatre of the university and the practical sessions were staged in the university’s large, fully equipped athletic hall.

In an anonymous feedback survey of the participants conducted at the end of the conference, 96% of those responding agreed or strongly agreed with the statement: “The conference as a whole was worthwhile and valuable.” As the conference organiser, I take this as

a clear indicator that our focus on specific disciplines, our practice oriented format and the quality of our presenters met the demands of both our domestic and international customers, and that overall the conference was a success.

The purpose of this report is to provide brief overviews of the presentations made in the conference, including the keynote speech, the presentations specific to the pole vault and high jump and the general coaching presentations.

Keynote

Currently the Senior Vice President of the IAAF and holder of numerous other important sport leadership offices, the Keynote speaker Sergey Bubka came to the world’s attention during his long and successful career as an athlete and he is now recognised as the greatest pole vaulter ever. His appearance as our opening speaker was definitely a highlight of the conference and set a positive tone for the whole weekend. In an emotional and passionate speech, he went through the various stages of his career, from the very beginnings in his hometown to his move to Donetsk at the age of 15 and through to the end of his career at the 2000 Olympic Games in Sydney. He spoke about his hopes and anxieties, his great moments, his unfulfilled dreams (including the unrealised goal of setting a world record at a major championship), his injury problems in the final stage of his career and the strategies he used to handle them. He highlighted the role of his coach, Vitaliy Petrov, in all his achievements. He ended with a message to the young athletes in the audience: “I want one of you to break my world record”.

Pole vault presentations

A critical discussion of the current technique of world class pole vaulters

Vitaliy Petrov (UKR)

Petrov, who is highly recognised for his work with world record holders Sergey Bubka and Yelena Isinbayeva as well as other world-class vaulters, started by explaining his view of the fundamental principles of modern pole vault technique. Then, referring to biomechanical data, photo sequences and video clips, he discussed individual deviations from these principles. His general critique of the world's current top male vaulters focused on their inferior abilities with regard to generating enough speed in the approach and preparing for the pole plant and take-off. He pointed out that run-up lengths had shortened from (typically) 20-22 steps during period 1985 to 1995 to 16-18 steps nowadays. He concluded his presentation by giving his views on the individual training strategies for developing young athletes in the German national team.

Recent biomechanical findings on the pole vault

Falk Schade (GER)

Schade, who is a researcher at the Rheinland Olympic Training Centre, gave an introduction to the energy transformation processes in the pole vault and a comparison of the findings from biomechanical studies from 1997 to 2005. He explained that during this period there have been no significant technical developments in the men's pole vault, while studies of the women's event show a significant increase in the interaction between the vaulters and their poles. He then showed evidence, both inter-individual and intra-individual, that an increase of approach velocity results in a reduction of the mechanical quality of the vaulter-pole interaction during the vault itself. This means that each vaulter has to decide where to he or she should focus their training strategy. In the last part of his presentation, Schade showed that, in an experimental study, he had found no evidence to support

the concept of the "free takeoff": the energy balance of the jump-and-plant complex is not influenced by the moment of the pole plant being early or late during the take-off action.

A mechanical and pedagogical study of the pole vault

Richie Mercado (USA)

In the months before the conference, Mercado, who is a coach and the secretary of NACACTFCA (North America, Central America and Caribbean Track and Field Coaches Association) conducted a survey of pole vault coaches throughout the USA, Europe and other countries. He was interested in their opinions on both the biomechanics and coaching strategies for the event. His aim was to identify model technical parameters and concepts of vital component parts and their interaction in athletes at different stages of development. The results showed that coaches could be classified in three groups: the first shows problems finding their way through the huge amount of available information on the pole vault; second tries to generate a "holistic view" of the event, leading to formulas like "continuous chain model"; and the third group avoids dealing with the available information and seems mainly performance oriented ("I don't care about the details, just jump high!"). Mercado presented many examples of coaches' responses, giving a good overview of the current thinking about the event. He said his study will go on and is open for reading or participation online at the following address:

<http://www2.sjs.org/Mercado/Pole%20Vault%20Project/PVP%20Web/The%20Pole%20Vault%20Project.htm>

"Running through" – An annoying disturbance of technical training

Ralf Bender (GER)

Most pole vault coaches have experienced a situation where the athlete is inexplicably unable to complete a vault in training or competition. Sometimes this problem can be persistent, leaving the athlete and coach helpless and frustrated. Bender, a pole vaulter



Sergey Bubka gives the keynote speech

with a PB of 5.40m and a victim of this problem himself, is researching the concept of fear and its relationship to this phenomenon. So far, almost 100 athletes from talented juniors to top-level performers have taken part in his study. In his presentation, he addressed a variety of questions including: 1) Are there significant differences in the personality structure of people suffering from this problem compared to others? 2) Are psychological aspects (fear, risk readiness, control of action, volitional competence) influencing the mental state while preparing for the jump? 3) Are the psychological processes during the preparation in different situations (training, competition, being in a “run-through” phase) different? The results of his research show that vaulters running though often display a specific pole vault fear, which can be caused by weather conditions or faulty equipment as well as accidents, but that their general risk readiness is not significantly different. The reduced volitional competence of these athletes causes less effective self-control. He advised coaches to take these problems seriously at the earliest possible stage and work out individual strategies in collaboration with a sports psychologist.

Developing individual training strategies in the pole vault based on analysis of technique and physical abilities

Herbert Czingon (GER)

Czingon, the German national coach for women’s pole vault, gave an overview of the different sources of analytical data on pole vault technique. From simple video analysis, for which there are a number of computer based solutions on the market, to more complex biomechanical studies made in cooperation with scientific partners, there are many tools available. He also spoke about testing different aspects of the preparation state of the athlete (speed, strength, special strength etc.) and how this data can help the coach to understand the structure of his/her athlete’s performance. The various tools can be used in a “top-down” way to generate insight from the most specific technical items and their biomechanical evidence to general physical aspects of the athlete’s fitness. Using a “bottom-up” planning method, coaches can develop individual strategies and a long-term concept for the athlete’s development.



Greg Hull (c) during the roundtable discussion

Current trends in the production of vaulting poles

Jeff Watry (GBR)

Watry, who works for pole manufacturer Pacer-Gill, gave insight on the modern production methods used to make world class vaulting poles. He explained that the company's efforts to further develop the pole include using sophisticated ways to choose, store and test the best suited materials. Pacer-Gill is constantly improving the process of designing and producing safe high performance poles and its ultimate goal is to produce the right pole for each individual vaulter.

High Jump Presentations

The IAAF World High Jump Centre

Wolfgang Ritzdorf (GER)

Ritzdorf described the origin, structure and coaching approach of the IAAF World High Jump Centre in Cologne, where he is the Director. After the German Sport University Cologne was recognised as an IAAF Accredited Training Centre in 2004 it became the permanent home for four African high jumpers and a temporarily training venue for some other top-level jumpers from around the

world. He explained that, due to the specific situation and composition of the group, topics like life balance, group dynamics, coach-athlete interaction, etc. play a very important role in the overall coaching approach employed at the centre.

Technical model of the high jump

Frans Bosch (NED) and Hans-Jörg Thomaskamp (GER)

Bosch, who was Netherlands' national high jump coach from 2003-2006 and now teaches biomechanics at the Fontys University in the Netherlands, described the theoretical background and the practical consequences when changing power flop movement patterns to the speed flop. He gave an anatomical analysis of the "high" versus "low" swing leg and the consequences for jumping mechanics. Based on the analysis of reflex activities during the final approach phase, the penultimate ground contact is crucial. He argued that it should meet the following criteria: 1) a short contact with knee extended, 2) as high as possible (do not sit on the p-step), 3) no heel to toe action (slack), 4) instant reaction - hip in upward direction. This technical model is supported by current knowledge about amortisation and elastic work.

Thomaskamp, who is one of Germany's most recognised high jump coaches, argued the need for technical models and why the best model for the high jump must be the speed flop. After explaining the technical aspects of the various phases of the jump, he identified eight key elements for an effective technique. His logical and stringent model was the subject of intense discussion in the roundtable session. Two major positions emerged: 1) a strict technical model is needed for both the long-term preparation of young athletes and for optimising performance, 2) unlike the other jumps, the high jump allows more technical variation - therefore technical models can be wider and less restrictive than in the other jumps. The very passionate discussion did not lead to a real consensus.

In the practical demonstration that followed the presentations, both Bosch and Thomaskamp translated the technical model into relevant technical drills, which were demonstrated by German national team athletes.

Biomechanics of the high jump

Jörg Böttcher (GER) and Wolfgang Killing (GER)

Böttcher, who is biomechanist at the Berlin Olympic Training Centre, reported on his 15 years of biomechanical research in the high jump, during which he has analysed more than 500 jumps by 170 athletes. All his analysis has been made in close cooperation with Killing, a former German national high jump coach. The huge database allows a wide range of technical and statistical analysis, which they use for the following objectives: 1) to identify the performance relevant parameters (technical model), 2) to identify the variation of those parameters with respect to the individual performance level (level of performance based on the technical model), 3) to correlate and inter-correlate defined parameters, 4) to identify individual performance trends. The two explained the analysis and feedback form with 70 selected parameters that is used. They discussed selected parameters (i.e. take off time; run-up speed; lowering of the CM) that coaches consider to be impor-

tant. Referring to his data, Böttcher showed that some of the assumptions coaches hold are not confirmed by scientific findings.

Psychological mentoring in high jump

Michael Gutmann (GER) and Jan-Gerrit Keil (GER)

Gutmann and Keil, who are both experienced sport psychologists and are close to athletics, reported on their psychological mentoring and supervision project with the German national high jump team. The project aims to improve competition behaviour and optimise performance. The focus is on: 1) goal setting and motivation, 2) regulation of arousal level, 3) self confidence, 4) concentration. Their very extensive work combines: individual structured interviews with both athletes and coaches, specially designed training sessions and observation of competitions. It also includes feedback and an online-questionnaire. They presented preliminary results of their analysis and interventions and suggested the project should be a permanent tool of co-operation with coaches.

General Coaching Presentations

Running mechanics for jumpers

Loren Seagrave (USA)

Seagrave, an experience sprint coach and the founder of Velocity Sports Performance, which has a client list that includes more than 50 Olympic medallists, presented his technical model of high-speed running. He highlighted six points of interest: 1) body position, 2) recovery mechanics, 3) transition, 4) ground preparation, 5) ground phase, and 6) arm action. Using both slides and video clips, he explained the key technical elements and discussed their meaning for run-up mechanics in the pole vault and the adaptation of stride parameters in the preparation for take-off. In the following practical session, he explained his teaching progression using a group of German national high jump team athletes for demonstration. His mission statement of the "pulling mechanics" was evident in all the drills covered.

Pilates Training – how to optimise professional sports

Tina Hense (GER) and Nina Metternich (GER)

Hense, a sports scientist and Pilates instructor who works with German Olympic athletes and Metternich, a physiotherapist, osteopath and Pilates instructor, presented a theoretical and practical introduction to the Pilates training concept. This body-and-mind centered approach is characterised by the following principles: 1) As much as necessary – as little as possible, 2) Consistent, harmonic distribution of forces through diaphragmatical breathing, 3) Body activation with axial elongation, 4) Complete awareness in every phase of the movement, 5) Selective movement and precise activation of the joints through optimal alignment of the body and the extremities, 6) Strengthening of the deep, local stabilisation musculature from inside out, 7) Mobilisation of the spine to avoid hyper- and hypo-mobility. These elements were visualized in excellent practical demonstrations.

Alternative Coaching

Greg Hull (USA)

Greg Hull, the USA's co-national pole vault coach and personal coach to 2000 Olympic Champion Nick Hyson, subtitled his presentation "Thinking outside the box" and this clearly described what he had to say. Near the start of his talk, he pointed out that during the first two days of the conference, none of his fellow presenters had spoken about the issues of how to be consistent or how to win, they had only talked about how to jump or vault high. His presentation then addressed a series of questions including: 1) What makes coaching an art? 2) What are principles of teaching and coaching ("Do not over-coach")? 3) What is the meaning of drills? 4) How important are rest periods ("Rest is not the opposite of work"; it's far better to under-train an athlete than to over-train him/her)? 5) What are the psychological factors in optimising performance ("Absence of efforting, forcing or trying harder")? It was a brilliant presentation that covered the range of performance relevant factors that coaches often miss.

Special features in coaching women

Wolfgang Killing (GER)

Killing, who is a former national coach and the current Director of the Cologne Coaches Academy, explained gender specific differences (and common trends) in the biological and physiological aspects of the development of male and female junior athletes. The detailed analysis leads to practical consequences for training girls/women including: 1) earlier and more weight training, 2) less high intensity reactive strength training, 3) women can and must train more, 4) slightly shorter regeneration phases, 5) training plans must take into account the monthly cycle, 6) reducing the percentage of fat is a source of performance improvement. He discussed each of the statements in detail, giving both the arguments for them and the consequences for practical work.

Additional points

The available powerpoint presentations have been posted on the conference website www.dshs-koeln.de/polevault2008. I would like to thank the German Sport University Cologne, the student volunteers and everyone else involved in the conference for their valuable contributions to its success. Special thanks to Herbert Czingon for both his work and his contribution to this report. I would also like to acknowledge the generous support of our sponsors Dartfish, Pacer FX, AF Sports, Schäper Sporterbau, the German Athletic Federation (DLV) and European Athletics.

Finally, I would like to inform the readers of this report that the 4th edition of the European Pole Vault Conference will take place in Cologne in March 2010.

Reported by Wolfgang Ritzdorf

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