

“Coaches’ Eye”

Technical analysis and fault finding as an internet application for coaching high jump

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ABSTRACT

According to psychologists and educators, humans learn most effectively, if they can grasp information via more than one sense and if they can try the information in practice as they learn. This article describes an online multimedia learning platform designed to use this approach to supplement coach education systems. It outlines the process of developing the application, including the identification of a universal technical model and creation of a catalogue of questions. This is followed by a description of the application, which includes sections for 1) technical analysis, 2) fault-finding and correction and 3) a library of drills. Each section is illustrated with screen shots from the program. The article concludes with a discussion of the uses of the application and the next steps in the project. The project described in this article was the overall winner in the 2006 European Athletics Science Awards.

information using texts, pictures, video and sound.

In the field of sports we find there are systems that organise, regulate and ensure the education of coaches but only very few online applications that use the possibilities of e-learning. For example, in comparison to other sports the IAAF Coaches Education and Certification System (CECS) stands out as a very well structured system of training programmes. However, within the system there is a demand for constant advancement and adaptation to changes in available data, technique and teaching approaches. There also seems to be a need for measures that would smooth the transition between the course levels (HOLLINGS, RITZDORF 2003) and for ongoing support of new coaches that cannot be met through traditional educational means such as courses and publications. Therefore, the use of an interactive multimedia teaching application, available through the internet and easily updated with new information, would seem a reasonable advancement for the CECS.

Introduction

In recent years, the use of multimedia based methods for teaching and learning has become increasingly important in areas of work and leisure activities. BRINKMANN (2000) predicted: "e-learning will become an important module of learning within our knowledge-based society and penetrate all educational institutions". The centre of attention in e-learning is applications that provide the user with

This paper describes the development of a multi-media learning platform, entitled “Coaches’ Eye,” designed to meet these needs. With the application using the high jump as an example presented here, the ideas and considerations mentioned above have been transferred into practice. The application is currently online and can be found under the following URL: www.coaches-eye.com.

This application is not meant to be an alternative to the personal supervision and instruction of a qualified lecturer, but rather a supplementary means of help for new coaches. By using the information presented, coaches have the opportunity to apply, check, improve or correct their knowledge and abilities in the areas of technical analysis and fault finding under professional guidance before, during and after training courses.

Realisation process

At the start of the project, extensive preliminary work had to be carried out in order to develop a catalogue of questions for the first section, entitled "Technical Analysis". A universal technical model of the high jump movement was defined, i.e. extracted from existing literature. To find the most important common technical elements, a convincing number of published commented photo sequences had to be found and analysed. Based on the model that emerged from this exercise, single aspects and elements of the movement were isolated and transferred to a catalogue of questions illustrated with collected pictures and videos.

Photographic and video materials were also used for a second section, concerned with fault finding and the coach's view of movements. Photo sequences and video recordings of jumps by athletes of all ages and ability levels were collected and new material was gained from several competitions and training sessions. The jumps were reviewed and examined to find technical faults and their causes. The faults were discussed with experienced high jump coaches in order to rule out disaccord or inconsistencies. This section is completed with numerous videos and photos of diverse drills for correcting the faults. By assigning the drills to the faults, questions addressing the complete

complex "fault - root cause - correction" could be created.

When digitalising and converting the video material into suitable formats, attention was paid to the fact that many computers still use an internet access with a very low transmission speed. Otherwise, the great number of videos and photos could lead to unpleasantly long download times, which could drastically reduce the motivation of users.

Description

After starting the application, "Coaches' Eye" welcomes the user and guides him/her through the necessary steps for registration. By following these steps, a user name and a password are created and sent to the new user by e-mail. From this point, the user has direct access and is permitted to work with the application.



Figure 1: Screenshot of the Coaches' Eye homepage

Besides the fact that now the user can access the application quickly at any time, the registration holds the advantage that the results of those questions answered are saved. Thus, if interrupted while working on a course, coaches do not need to start over at the beginning when they resume.

The application is divided into three different sections:

1. "Technical Analysis"
2. "Fault Finding"
3. "Library"

Within the sections “Technical Analysis” and “Fault Finding”, the user has the opportunities to decide:

- within “Technical Analysis” he/she can choose between “Simple” - “Intermediate” - and “Difficult”;
- within “Fault Finding” he/she can either attend to questions concerning “Beginners” or “Advanced Athletes”.

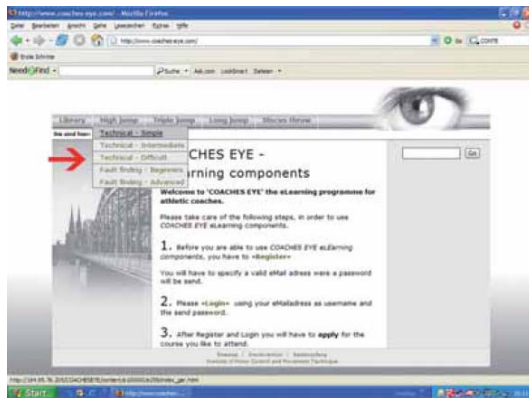


Figure 2: Screenshot - Courses

The third section is the “Library”. Here, specific videos of drills as well as videos of world-class athletes are available.



Figure 3: Screenshot: Library

The learning contents were processed into detailed questions. By this means, coaches are able to test their knowledge and abilities concerning the respective courses. The screenshot in Figure 4 shows an example of such a question.

After the user has picked one of the possible answers and submitted it, the right answer is shown and he/she can

continue working on the next question. Due to the fact that the programme focuses on a free accessibility and the support of existing coach education systems, questions are not constituted in terms of an examination. After every submitted answer, the user gets either a positive or negative feedback (Figure 5). At the end of the respective course, no mark or assessment is given.

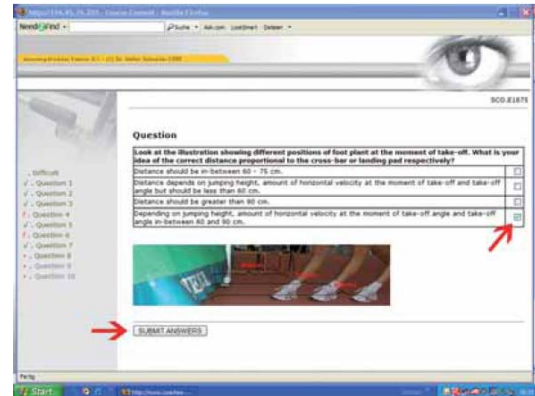


Figure 4: Screenshot of a question

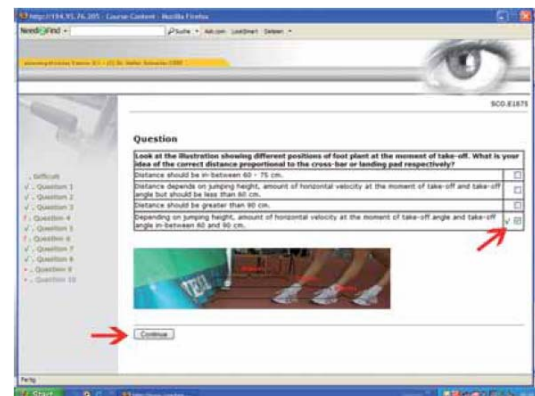


Figure 5: Screenshot - example of a positive feedback

The learning contents follow the course of a typical technical training and aim to offer new coaches practice-oriented support concerning their education and their future work. The most important aspects of such training lessons were taken up accordingly and the contents of the online application configured respectively.

“Technical Analysis”

By working on the course “Technical Analysis” coaches will be able to identify a correct technical model and reassess their ideas of the key elements of the “flop” technique. With the categories “Simple”, “Intermediate” and “Difficult”, users can adapt the degree of difficulty of the course to their current level of knowledge. In the category “Simple”, questions (see Figure 6) try to give an idea of a general technical model.



Figure 6: Technical Analysis (Simple) – Question 1

The questions in the second category (“Intermediate”) are a little more demanding and detailed and the key elements of the flop technique are elaborated.

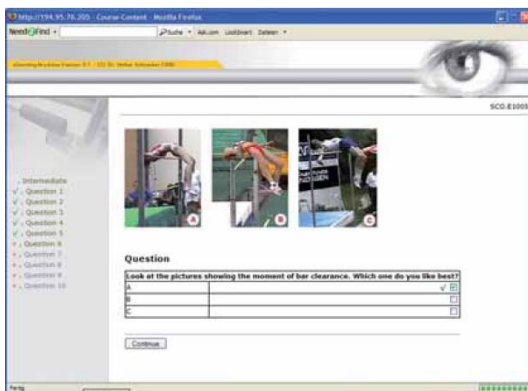


Figure 7: Technical Analysis (Intermediate) – Question 5

In the most challenging category (“Difficult”), questions concerned with biomechanical aspects of the high jump (see Figure 8) as well as questions

dealing with the variations of movement characteristics within the different phases of the jump predominate.

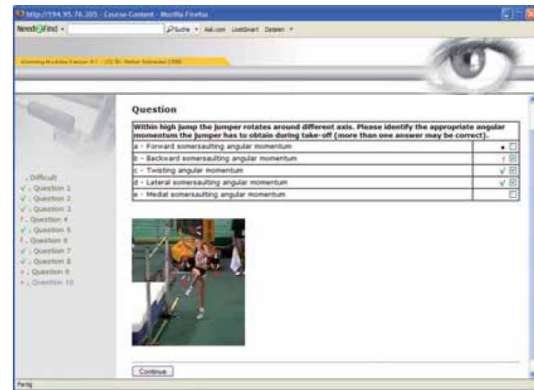


Figure 8: Technical Analysis (Difficult) – Question 4

“Fault Finding”

The course “Fault Finding” challenges coaches to survey and evaluate high jump videos and photos. As in a real training session, they are asked to identify major faults and the corresponding root causes. The ensuing question allocates a selection of drills that might help to correct the identified problem. Coaches are asked to identify the drill that will effectively help to eliminate the mistake and lead to a better performance of the athlete.

It is rare that a training group turns out to be homogeneous. More often than not, athletes show different talents, skills and levels of development in the respective disciplines. In order to cope with this fact, a matching classification (“Beginners” and “Advanced Athletes”) of the section “Fault Finding” was made. The purpose is to give coaches an understanding of the movement patterns and to enable them to identify the movement error – and corresponding root cause – made by their own athletes. Therefore, almost all the questions have three-parts. The task in the first part is to identify the major fault of the athlete shown in the picture or video.

In the second part of the question, users are confronted with particular root causes that might be responsible for the identified fault.

The third and last question that typically goes along with the ones before involves choosing an appropriate drill that would help to correct the athlete's problem. For this purpose, the application provides the opportunity to look at the various drills on videos.

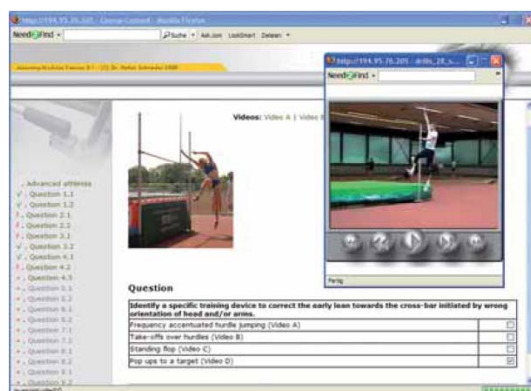
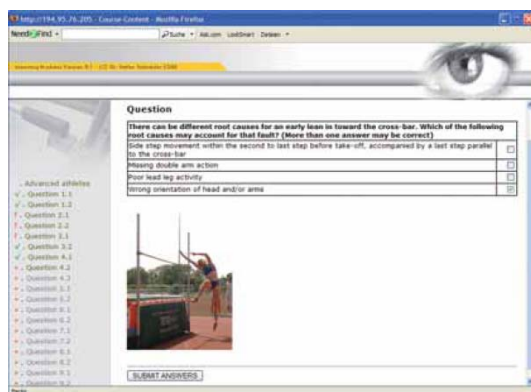
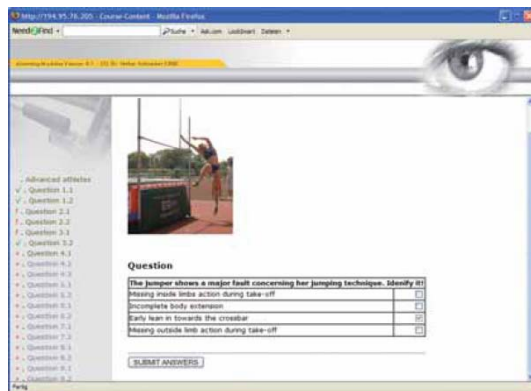


Figure 9: Fault Finding (Advanced Athletes) – Questions 4.1, 4.2 & 4.3

Library

In this section of the application, all drills used in the questions described above are collected. This allows coaches to return to a certain video immediately without having to find and work on the appropriate question; i.e. coaches have the opportunity to look at those videos at any time independent of their remaining work on the courses. Additionally, videos of world-class athletes were included in this section. These serve as visual aids for coaches as well as athletes.

Discussion

According to psychologists and educators, humans learn most effectively, if they can grasp information via more than one sense and if they can try it out in practice at the same time. "The main idea is to lead the learner towards a consolidating and thorough processing of the learning material, because this seems to determine, how well it will be remembered" (SEEL 2000). Consequently, it seems to make sense to learn new things by experiencing visual, audio and interactive examples.

In comparison to textbooks, the computer based "Coaches' Eye" offers the opportunity to experience technical elements, faults, and their correction by looking at vivid videos instead of lifeless pictures. Another benefit of this computer-based working and learning can be seen in the direct feedback, coaches will get after answering the questions.

As a supplement to the courses of the CECS or independent of it, coaches using the application have the opportunity to set their own priorities and pace. CECS course participants can gain certainty, new exercises and ideas by working through the different sections and the different levels of difficulty within the sections. Furthermore, knowledge gaps can be filled and heterogeneous preconditions before CECS courses can

be – at least partially – brought into line on coaches' own initiative.

In the first attempt to create the application, the content was only concerned with the high jump. Further development and improvement is currently under way with work on the long jump, triple jump, pole vault and discus throw as an element of the degree requirement for students partially under my supervision at the German Sport University in Cologne. Eventually the application will cover all the field disciplines, sprints and hurdles. Until the contents for all the disciplines are completed, the program will be gradually tested and improved.

So far, the content is in English only but consideration is being given to translation to French, Spanish and other widely spoken languages. The use of "Coaches' Eye" is cost-free (except those costs for the internet access).

Conclusion

"Coaches' Eye" is an attempt to introduce online multi-media learning methods into athletic coaches' education with a focus on the high jump. The open access, online application is supposed to be an addition to the well-established education system of the IAAF (CECS) and does not try to replace any of its parts. It is meant to be a support and a close-to-practice help for its users. Numerous questions concerning technical analysis and fault finding in high jump together with a matching pool of correction drills have been created and made accessible. Working with the application before, during and after CECS courses, or the courses of other coach education programmes, will make it possible for coaches to check and extend their knowledge and improve their ability to conduct training sessions.

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