

Weekend training camps: teaching and evaluating competitive swimmers, master swimmers and triathlon practitioners

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Introduction

The purpose of this paper is to describe a procedure for evaluating swimming practitioners that combines theoretical and practical learning activities. These will benefit athletes and non-athletes alike, applying sophisticated tools (digital video, computer software, objective evaluation and so on) to ordinary people. That has considerable impact in their motivation thanks to, for example, the possibility to compare their technique with swimming champions. The demonstrations were also performed by a swimming champion included in the group that organized the evaluation weekend camp. This activity resulted in obtaining additional funds for our swimming research work that is poorly supported in our country.

Organization and methodology

Subject Recruiting

After preparing a layout of the activity we decided to look for a limited number of assistants (no more than 40). Because the cost of the activity was relatively high we decided to open the sample to master swimmers and triathletes in order to find a population able to pay the price, usually older and economically independent practitioners rather than normal competitive swimmers. This resulted in sample of swimmers with a large age range and swimming skills.

In this case because we are calling for triathletes

we developed the activity oriented to freestyle or crawl-stroke. Some swimmers were evaluated in a different stroke than freestyle paying one additional fee.

Activities

Five types of activity were planned: 1) theoretical lessons about the crawl-stroke; 2) video recording and measurement of the start, turn and swim technique; 3) basic anthropometric and body buoyancy evaluation; 4) land activities and 5) crawl-stroke drills demonstration and practice.

Theoretical lessons

The theoretical lessons included the video visualization of good swimmers, describing their key stroke-points; a basic description of the technique and some tips to organize the practice drills in the training lesson and seasonal plan. Technique models: Each participant received information sheets (included in a CD) with a practical description of each of the three freestyle skills: swimming, starting and turning. Every phase is detailed with pictures and relevant scores (Samples are shown in figures n° 1, 2 and 3).

Video recording

A complex setup with more than 5 video cameras over and underwater was used. This allowed us to video record a sagittal view over and



Figure 1: Samples of the explanation and illustration sheets used to describe the free-style swimming technique.

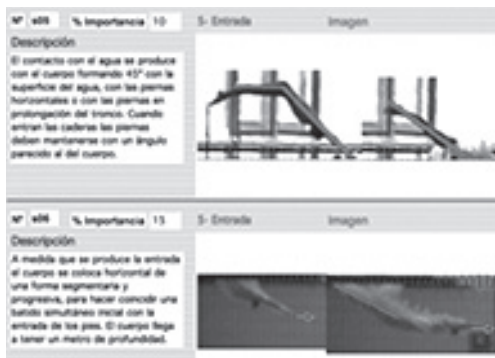


Figure 2: Samples of the explanation and illustration sheets used to describe the free-style start technique.

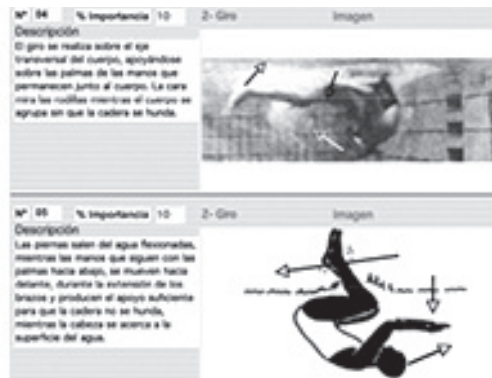


Figure 3: Samples of the explanation and illustration sheets used to describe the free-style turn technique.

underwater and views of their technique from the front and bottom (see figure 4). The start was video-recorded in the aerial and underwater phases until 15m (see figure 5). The turn was video-recorded over 15m (5 turn-in plus 10 m turn-out) (see figure 6). Each digital video recorded allowed us to measure basic quantitative data such as start and turn times, swimming velocities,

stroke length and frequency and so on. A mistakes database sheet was included in the individual information supplied, with a picture of the subject stroke mistake, mistake description and a picture of the correct performance of the stroke.

Basic anthropometric and body-buoyancy evaluation.

After performing these kinds of evaluation for

years we adopted a system of assessment based on qualitative criterion-referenced standards instead of norm-referenced measurement. This is particularly useful in this group of non-elite swimmers. Three flexibility and one-buoyancy tests were measured. In all cases a minimum criterion (easy to measure) is established based on our previous studies with thousands of swimmers. If the minimum criterion is not obtained we recommend an extensive work of flexibility in the specific area: shoulder, trunk or ankle

Land activities.

Different types of exercises are proposed in the two possible sessions (about 50 minutes of duration): Core body strength based on the Pilates method, flexibility work applying simply and

classic Yoga and shoulder injury prevention describing the typical group of exercises applied in this topic. The sessions are wake-up activities at the Saturday and Sunday morning before the water work-out. The exercises are demonstrated and explained, monitoring the breathing synchronization with the exercises phases.

Crawl-stroke drills demonstrations and practices.

Two practices are oriented to learning and improving the freestyle technique. The activity is organized starting with an explanation followed by demonstration performed by an elite swimmer. Later the participants repeated the drill. The two sessions are organized in three different groups of drills:



Figure 4: Underwater and sagittal views obtained from the cameras used to video record the free-style stroke technique of each participant.

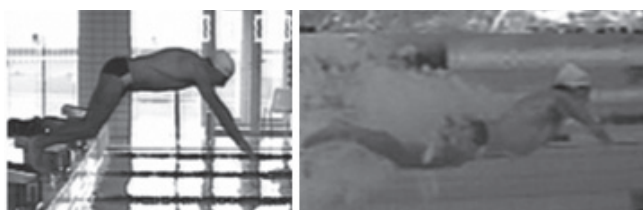


Figure 5: Aerial and underwater view obtained from the cameras used to video record the free-style start.



Figure 6: Underwater view obtained from the cameras used to video record the free-style turn.

Flexibility 1	Flexibility 2	Flexibility 3	Buoyancy
<p>Shoulder hyper-flexion. The criterion for the evaluation test is establishing the horizontal body position.</p>	<p>Trunk flexion: The criterion for the evaluation test is to touch the floor with the palm of the hands keeping the knees straight.</p>	<p>Plantar flexion of the ankle. The criterion for the evaluation test is to get a straight line between the front of the foot and the shin.</p>	<p>The vertical buoyancy test. In this case there is no specific limit because it is very individual and we cannot do anything to change it (in a short period of training). The individual obtains information about the degree of buoyancy in a qualitative way (how they sink!)</p>

The drills are linked with the freestyle phases and key-factors described in the theoretical lessons. Each group of drills addresses specific errors found in the individual evaluation.

After the participation in the lessons described, the swimmers experimented a noticeable improvement on their technique. The cause is the change of the body position plus the imitation of the international swimmer that demonstrated the drills. The motivational atmosphere created in the group plus the positive reinforcement and feedback helped to stimulate the improvement.



Final report

Each participant received an individual electronic sheet showing a list of his more important mistakes. These mistakes lists include a picture of the swimmer at the moment of making the mistake (frontal, lateral or from the bottom) and a graphical and verbal general description of the mistake. This database is linked to the correct technique description where the swimmer can compare his performance picture with the

model. A second link relates it with the list of exercises proposed to correct it. The list of drills is a group as previously defined in the practices. This related logically all the information, theoretical, practical and the individual assessments (see figures 7 and 8 to understand the process described in this paragraph).

Session 1:

Group 1: Differentiating the body positions in the water. The drills tried to distinguish between horizontal and non-horizontal body and head positions while performing mostly kicking drills.

Group 2: Improving the body position. In this case the drills were directed to recognizing the proper body position changing the positions of the arms.

Group 3: Improving the freestyle coordination (arms, legs and breathing). All drills are aimed at achieving proper coordination with streamlined position.

Session 2:

Group 1: Exploring types of propulsion. The lateral and vertical hand movements that produce lift. This propulsive force is applied to each drill (analytical or global).

Group 2: Developing propulsion. The hand changes cyclically its propulsive surface or position. This contrasting feeling helps the swimmer to find an optimal pulling path or hand position.

Group 3: Increasing swimming speed. The final target of our method. You can swim better but you need to swim faster and this is the unique aim. The drills are oriented to developing strength and power in the water and fine-tuning the crawl-stroke.

Conclusions

The lack of interest about scientific support in Spanish National Team stimulate us to apply our experience and sophisticate equipment to swimming practitioners with interests on their improvement to participate in master swimming competition or

triathlon. This new panorama opened new directions in own research interest more related with the “normal” population than top-level swimmers.





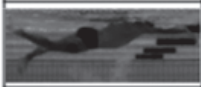
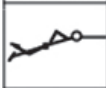



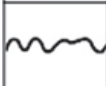
OBSERVACIÓN DE LA TÉCNICA DEL ESTILO CROL			
Código	Foto Error	Descripción	Figura
49		La mano en la mitad de la tracción no llega a pasar debajo del cuerpo	
43		Tracción con dedos separados	
1		Cadera y extremidades inferiores demasiado bajas	
62		Rodillas demasiado flexionadas	
85		Batido discontinuo especialmente cuando se realiza la inspiración	

Figure 7: Sample report distributed to each participant were their stroke mistakes are listed and related to a verbal and visual description of the error compiled in external database. The code showed in left column will help to the participant to locate it in the general sheet where the proper technique, mistakes and drills are organized and related (see next figure).





Nº 12  Errores Relacionados Descripción El codo se coloca por encima de la mano y el antebrazo durante el movimiento a medida que realiza el movimiento hacia abajo, manteniendo el brazo horizontal. Valor % 5	23  Traiciona con el codo ligeramente caído 24  Traiciona con la mano horizontal y el brazo extendido 43  Tracción con dedos separados	Secuencias de Ejercicios 2.1. Explorar los Tipos de Propulsión 2.2. Desarrollar la Propulsión

Figure 8: In this case the mistakes related to the phase, and the group of drills that could be applied to the correction of the mistakes are included on the right side of the picture.