

Elements Of A Training Set

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Coaches should take holistic approach when working with the athletes. This applies to all aspects of coaching including design and implementation of a single training set.

To achieve its objective a set must contain four interconnected elements:

- Biomechanics (Technique) – repeated movements of the limbs and body to propel the swimmer through the water forward in the most efficient way.
- Energetics (Physiology) – conversion of chemical energy to mechanical energy necessary to move the swimmer through the water. There are three simultaneously working main energy systems: the Alactacid System (fuels very short all-out efforts lasting up to 12 sec such as 25 m sprint), the Lactic Acid System (fuels high intensity movements lasting between 30 sec and 3 min such as 50m, 100m and 200m events), and the Aerobic System (fuels moderate intensity movements lasting longer than 3 min such as 400m, 800m, 1500m and open water events). At particular times within workouts and sets a particular system will be dominant.
- Psychological Skills – the deliberate use of structured sequences of specific thoughts and behaviours: goal setting, self-talk, mental imagery, relaxation and activation and being able to regulate one's self-confidence, motivation, anxiety, and attention. Psychological Skills are learned from coaches' instruction and natural learning experiences such as competitions.
- Character Development & Life Skills – the ability to work in a team, collaborate with others, grit, self-control, social intelligence, optimism, gratitude, loyalty, honesty, courage, integrity, fortitude, respect, responsibility and many more.

Here are some practical set examples:

1. Middle distance Freestyle, long course

All 200s are high intensity efforts and done at target heart rate of 175 – 180 beats per minute

All 50s are easy efforts and aimed for active recovery

4 x 200 on 2:35 + 1 x 50 on 1:00

3 x 200 on 2:30 + 1 x 50 on 1:00

2 x 200 on 2:25 + 1 x 50 on 1:00

1 x 200 on 2:20

Biomechanics of the set.

During 200 efforts the swimmers are instructed to focus on the following: correct body position; high elbows during catch and pull-through phases; hands acceleration; even and continuous transition of muscular power from one arm to the other arm to minimise speed fluctuations within stroke cycle; consistent and fast kick; holding breath in the last 3 strokes before the turn; pushing off the wall after the turn into tight streamlined position followed by 3 butterfly kicks; holding breath during first stroke at breakout.

During 50 recovery swims the athletes are to execute correct Freestyle technique at controlled easy effort.

Energetics of the set.

During 200 efforts the swimmers are instructed to hold within 92-94% of their PB times to improve their Lactic Acid System and further develop their maximum oxygen uptake abilities.

During easy 50s the swimmers are instructed to hold slow speed at approximate heart rate of 125-130 beats per minute in order to partially restore energy levels. This will enable them to maintain high speed of 200 efforts.

Psychology of the set.

This is difficult and mentally demanding set and the swimmers are explained by the coach that making the target times will prepare them to make a PB performance at the upcoming major swim meet.

The swimmers are advised on mental imagery (looking strong, graceful and powerful) to execute great technique and racing skill (turn) under fatigue.

The athletes are motivated to do the set at the best of their ability as they know it get them even closer to achieving their goal.

Character and Life Skills.

The swimmers develop high respect for one another and team atmosphere as they are in preparation for the 4×200 relay at the upcoming State Championships.

2. Butterfly Kick, long course

The set is done on front with snorkels. Target time is PB swim time + 20sec. Target heart rate is 185-190 beats per minute.

4 x 100 on 1'55

Rest 45"

4 x 100 on 1'50

Rest 1'

4 x 100 on 1'45

Biomechanics of the set.

The swimmers are instructed to focus on the following: correct and streamlined body position, minimize body undulations, stay parallel to the water surface; head is tightly squeezed between the arms; body's core is fully engaged.

Energetics of the set.

During 100m efforts the swimmers are instructed to hold within 20 seconds of their PB swim times to improve their Lactic Acid System as well as develop their ability to tolerate high lactate level.

The swimmers are explained that during two resting periods they will partially restore their energy level to maintain targeted kicking speed.

Psychology of the set.

This set requires concentration on tight streamlined body position under maximum kicking effort. The swimmers are explained by the coach that minimizing body undulations and staying flat in the water will develop their Butterfly race specific technique which will build the swimmers' confidence of making strong second half of 200 Butterfly event. The swimmers are

motivated to achieve the set's targets because improving this event will give them opportunity to qualify for Open National Championships.

Character and Life Skills

The swimmers develop self-control skill as they are trying their very best to hold the technique at maximum kicking speed and under fatigue. They also collaborate with the coach in terms of executing the set exactly as instructed because they know it is necessary for their own benefits.

3. Racing Skill: No Wall Turns, long or short course

The swimmers start by pushing off the wall and swim out at race speed to 15m mark. At the 15m mark they execute the turn, break out and do several strokes. Then they swim up at a recovery speed to the starting position.

10 x 25 Butterfly to Backstroke Individual Medley transition on 1'15"

Biomechanics of the set.

The swimmers are instructed to focus on the following: correct Butterfly and Backstroke technique at top speed, tight and compact turn at imaginable "wall", strong push-off the "wall" into powerful streamlined underwater Butterfly kick on back. The swimmers are instructed to make targeted number of kicks that they had practiced before using physical wall. They are also instructed to hold flat body position (head is in line with the spine) just before breakout. At breakout point the athletes execute first stroke with their lower hand and then break out on their second stroke made by upper hand. During breakout the swimmers rotate their bodies to a particular side to achieve maximum breakout speed. Following breakout the swimmers are instructed to make their first three strokes as most powerful to maintain race speed.

Energetics of the set.

The swimmers are instructed to perform at 97-98% of their top speed. This set covers two energy systems: the Alactacid and the Lactic Acid.

Psychology of the set.

This set requires setting specific skill goals such as executing targeted number of underwater butterfly kicks on back in multiple repetitions as well as attention to details such as beginning of breakout from the lower hand and holding head in line with the spine.

The coach makes the swimmers aware of relation of this particular skill to their successful performance in both 200 and 400 IM. Improving these events will qualify the swimmers for States.

Character and Life Skills.

While performing this skill set the swimmers develop such values as self-control and grit as they work through this particular Individual Medley transition in the unusual and uncomfortable situation: practicing the turn without the wall at race speed aiming for set targets and controlling their breathing. The coach may also facilitate certain social environment within a training group where better skilled athletes have positive effect on less skilled athletes by observing them from under water and providing with positive feedback. This situation has positive impact on the swimmers' social intelligence.

Training sets can only be limited by coaches' imagination as long as they are related to particular events and develop swimmers' technique, racing skills, physiological abilities, have mental focus and contribute to person's positive character traits.

References:

<https://www.pdhpe.net/>

<http://psychology.iresearchnet.com/>

<https://www.viacharacter.org/>