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From Treading Water to Swimming Uphill: A Comprehensive and Innovative Assessment Program for Teaching Swimming in Belgian Primary Schools.

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Abstract

According to the World Health Organization (WHO), every child should learn to swim as a recognised life skill. Which swimming skill or stroke to learn first is not the most important question. What is important is to teach children to learn tasks or techniques which allow them to they feel safe. Emphasizing foundational principles of motor development and focusing on safety in and around the water are paramount. Beginning in 2016 school swimming lessons in Flanders (Belgium) were given a new focus in all educational institutions. Foundational competence tasks replaced the focus on acquiring competitive swimming strokes as the primary objective. As part of this process, our instructional methods began to include the use of practicing in deep water. This paper identified didactic and pedagogic screening practices of the revised water safety program and highlighted the importance of simplifying the teaching and learning methods as much as possible. One important didactic innovation used by the authors was to categorize swimming exercises using a color-coding scheme.

Keywords: swimming lessons, drowning prevention, primary schools, Belgium, water competence, teaching and learning, instructional methods, color-coding

Flemish Schools Focus on Water Safety

Beginning in 2016 all primary schools in Flanders, Belgium have changed their compulsory 'swimming programs' and have focused on what we call the Orca Certificate. In the past, children swam short distances in a simple version of the breaststroke, a popular swimming stroke in Flanders. The goal was simple and consisted of swimming in a straight-line with the focus being on distance, not the quality of the swimming stroke technique. Traditionally, schools paid less attention to concepts such as the elements of water competence and instead focused immediately on the teaching of swimming strokes, which often proved to be rather challenging. The achievement of the 'popular' 25m breaststroke certificate was paramount. This simple objective led to major differences in children's swimming proficiency or competence and in the curriculum of swimming programs in the schools. Furthermore, important differences had been noted between the outcomes in urban schools and rural schools.

In 2010 four devoted swimming instructors started a project entitled 'Baan Vier,' (i.e., 'Lane Four' in English), which brought together new ideas about swimming programs in primary schools. As a result of the initiative of these four academic teachers, all stakeholders collaborated to introduce a more uniform approach to standardize how swimming programs were structured and taught across the country.

During the World Conference on Drowning Prevention 2013 in Potsdam, Germany and again during the Lifesaving Foundation Conference 2014 in

Photograph 1. "Baan Vier" Flemish swim program focuses on modifying the aquatic environment to promote learning

Balbriggan, Ireland, Professors Stallman, Moran, and Langendorfer had introduced what they called a water competence framework for swimming and drowning prevention. We used the concepts and recommendations of these international experts to give a new focus to swimming lessons in Flemish schools. Through a compulsory curriculum, all children up to the age 12 years were required to work on two important goals in their swimming programs. In 2015 Flanders introduced the new 'water competence' certificates, and all primary schools began using the Orca Certificate.

This rapid change in the Flemish swimming curriculum and teaching style can be explained in several crucial steps and methods.

1. Parents and Physical Education teachers were asked to distinguish the verb 'swimming' from the sport of 'swimming' and highlight the most important element of their child's education. The safety aspect clearly came first. As a result, water safety now became the primary step in the swimming learning process while mastering competitive swimming techniques was secondary.
2. Moving in the water is not always natural for humans and is considered to be a complicated motor activity. Being able to explain this matter in a simple way leads to a better understanding, learning, and is crucial for giving swimming lessons. The 'copy-and-paste' method of swimming lessons has been replaced by a more clearly structured developmental approach. Some teachers were unsure about the overall teaching of swimming; therefore, the initiators set a clear goal: "Explain 'moving-in-the-water' and its associated learning process more simply. We must keep this process as clear and practical as possible.

Challenge 1 – Keep It Simple

The initiators compared the teaching of swimming with the teaching of bicycling. After all, many parents recognize themselves in the role of teacher and often teach their children to cycle in the garden. We asked parents, "if children can cycle in the

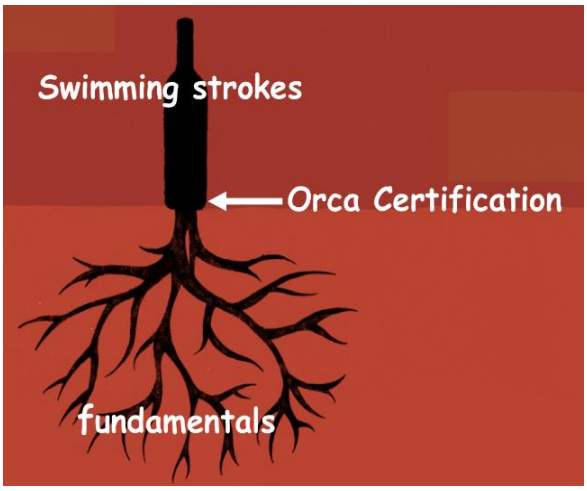


Figure 1. Graphic illustration of Orca Certification swim program model

garden, are they ready to cycle in traffic?" The same analogy was applied to swimming. Parents now have begun to understand that swimming involves much more than moving in a straight line using one simple stroke. Figure 1 shows a bottle of wine growing on a broadly branched network of roots. This diagram helped teachers and parents to understand the relationship between the underground diversity of roots and the quality of the above ground product. The logical conclusion was that the process of making good wine starts underground. The stronger the root network, the better the wine.

This metaphor provided insight that the fundamental 'water safety and swimming skills' (or water competence elements) pictured as an underground root system were a foundation for the above-ground acquisition of advanced swimming skills and strokes. In primary schools, the new Orca Certificate tested these fundamental competencies and checked whether the child was ready to learn the swimming strokes.

Orca Certification measures fundamental 'water safety and swimming skills' which consist of propulsion with the legs, the arms, on the front and on the back along with acquiring breath control, body orientation, control of rotation (full range of motion), streamlining body position and control of floating on the back and front (Soons, Van Iseghem, & De Martelaer, 2013). Our primary objective was

to focus on these fundamental skills (competencies); the acquisition of advanced swimming skills and strokes was a secondary or even tertiary objective. The new three-stage teaching program expressed how the underground "root" foundation progressed developmentally and progressively:

1) the process begins with learning 'water familiarisation' tasks;
2) then practicing them in deep water as 'survival tasks,' and finally
3) progresses to the acquisition of 'water competencies' (Figure 2 and Photograph 2).

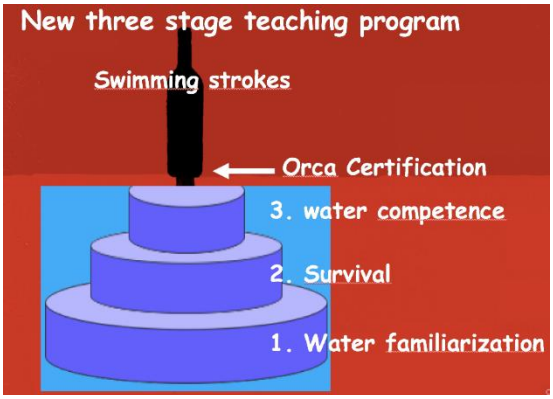


Figure 2. Orca certification as three-stage learning process

Photographs 2a – 2c. The essence of Orca Certification is child-centered teaching that is simultaneously challenging and inviting

A survey of swimming instructors showed that the teaching of survival skills in the deep end was in particular need of review. The distinction between 'water familiarisation' and 'survival in deep water' can be defined as 'water familiarisation' is practised in the shallow end of the pool, whereas learning to survive is practised in the deep end.

Photograph 3. Deep water learning plays a central role in Orca Certification.

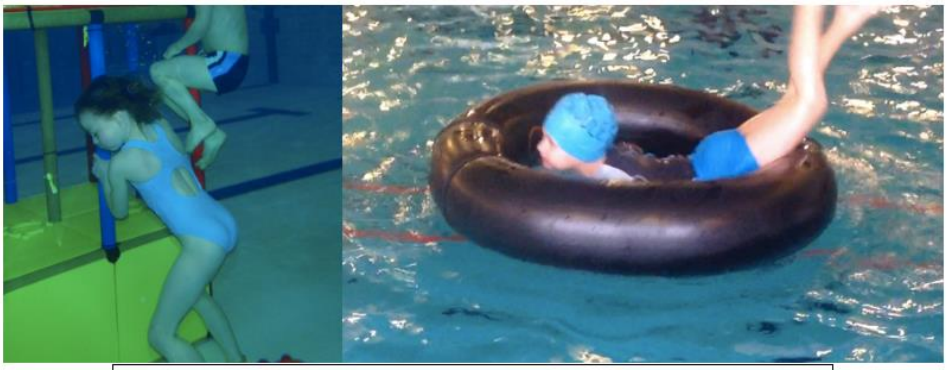
Challenge 2 – Children Need More Practice in the Deep End

With the 'survival in the deep end' stage, a basic principle remains for each teacher: the more we focus on deep water experiences in each lesson, the quicker the child becomes familiar, comfortable and confident in deep water.

Photographs 4a – 4d. These examples illustrate how to build shallow places in deep water to ensure safety and encourage

In order to work as environment specific as possible, it is important to clearly know and accentuate the differences between locomotion on land and in water. The motor skills of the child are optimally combined in their new environment so that new specific competencies develop in the deep end (Langendorfer, 2013; Langendorfer & Bruya, 1995). More effective task

proficiencies replace 'less effective habits' (e.g., retro-flexed head, hand and arm flexions, resistance to buoyancy and unstable situations).



Photographs 5a – 5b. Inefficient habits must be replaced

New equipment also was used in the deep end to achieve an ideal and safe learning environment. These include a moveable platform at the bottom of the pool allowing shallow parts to rise; moveable handgrips on the wall, leading step by step to the bottom; easy to grip taut ropes on the surface, which bridge deep parts of the pool. This didactic approach is child-friendly, inviting and challenging (Langendorfer & Bruya, 1995; Schmidt, 1999).

Challenge 3 – Simplify the Methodology

In addition to the adjustments in the swimming pool (i.e., use of shallow and deep water; use of novel equipment), the instructors must keep their instructions straight forward and easy to understand. This is why all drills must be logically structured (Figure 3). Drills create an efficient framework for children, so that developmentally appropriate experiences are gained. Empirically these adaptations are based on three particular parts of the body: the head, the torso, and the limbs.

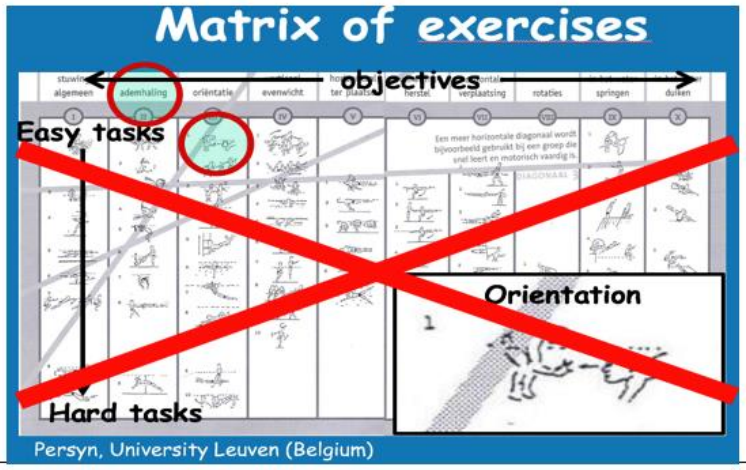


***Figure 3**. Logically arranging the drills in one matrix does not always provide the required simplicity. Tha same exercise can sometimes be used for multiple purposes or objectives.*

In Flanders we call these body parts our three fundamental "building blocks" for swimming. Because humans are naturally land animals, when we enter a new environment such as water we must adapt our movement behaviors (Langendorfer, 2013). We chose to focus on the three body parts that we felt must make major adaptations in the water. We strove to distinguish each "building block" from each other in the following ways.

1. The face and head: New head and neck movements and behaviors such as adapting and feeling comfortable when immersing the head, orienting on the bottom of the pool and not on the horizon, changing breathing patterns are required.
2. The torso: New movements and behaviors such as adapting center of gravity and center of buoyancy forces in your body, feeling comfortable when you are in a horizontal floating position, feeling confident to roll, turn, flip are needed.
3. Use of the limbs (i.e., arms and legs): New ways of moving the arms and legs such as using your limbs to propel through fluid water are required which involve very different motor patterns from those used in walking on land.

Organizing Exercises Using Colours

The power of a three-part taxonomy is the direct simple relationships among all three elements. Using a triangle metaphor, the three building blocks are always in contact with each other and combinations arise (see Figure 4). This triangular taxonomy can be represented in a similar manner to that used in somatotyping which describes the degree of three body types (i.e., ectomorphy, endomorphy, mesomorphy) representing a human body's shape (Taets, 2015). In each combination, the degree of presence can be displayed and classification

possibilities are created. The comparison with the numerical identifications of colours is made and worked out.

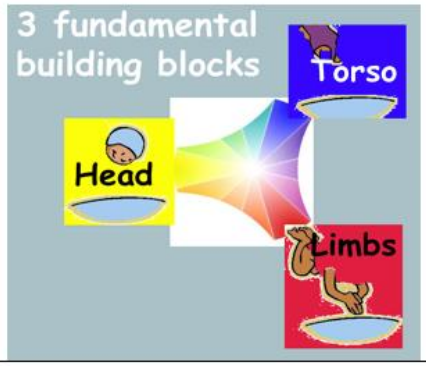


***Figure 4**. In a three-part taxonomy there is a direct relationship beyween all the elements.*

A three-part numerical code indicated the relationship between the primary colours and other colours that are formed by their combination (Taets, 2015). By analogy with the colours of the visible light spectrum, the three-part number code of a drill in the pool determines the relationship between the building blocks: the head, the torso and the limbs (Figure 5).

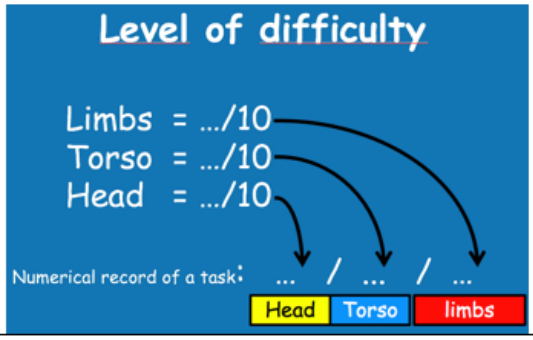


***Figure 5**. A three-part number code determines the relationship between the building blocks; head, torso and limbs.*

These three building blocks are present in all practice exercises and activities as well as at every level, although always in a different relationship. In each building block we focus on simple and clear instructions to describe how to provide effective exercises. In other words, how do we determine the level of difficulty in the exercises for the head, the torso and the limbs?

The level of difficulty is determined by the number of new tasks students must acquire upon entering the water environment. The more adjustments swimmers have to make (i.e., compared to moving on land), the more difficult an activity or task becomes. For example, the number of immersions of the face and head, the degree of horizontal body position, and the stability or body equilibrium with no support or a flotation device all could increase the task difficulty. For each of the three building blocks, the degree of difficulty is expressed on a scale of 0 (not at all difficult) to 10 (very difficult). Thus the three numbers provide a unique and three-part combination allowing us to keep a numerical record of the degree of difficulty involved (Figure 6).

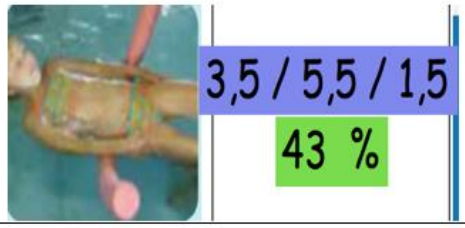


***Figure 6**. The percentage of difficulty can be calculated on the basis of a three-part number code*

If we focus upon one building block at a time, the number of new activities from the other two building blocks is minimal and thus theoretically simplifies the task. If the percentage of difficulty is <33% (see Figure 7), one is working at the level of 'water familiarization.' If two building blocks are practised simultaneously (e.g., head and torso), the task becomes more difficult (between 33% and 66%) and we reach the difficulty level of "survival in the deep." Combining and practising three building blocks brings us to the level of ‘water competencies’ (Roelandt, Soons, Van Schuylenbergh, & Van Gerven, 2014).

***Figure** 7. The three stages of the teaching program that lead to the Orca Certification can be classified according to their percentage of difficulty.*

When the percentage of difficulty exceeds 66% and the student demonstrates proficiency in performing those tasks, we have reached the level of the Orca Certification and only then is the child ready to start the acquisition of competitive swimming strokes.

We believe these numerical identifications represent a useful and powerful measuring tool which can be used to design a logical order of practice exercises, build instructional programs, visualise learning curves (e.g., smooth, erratic, gradual, or steep), and evaluate a swimmer's readiness to achieve certificates. Ultimately, our classification has provided increased clarity and guidance for our teachers' instruction. This was an important key element of success in the evolution of swimming programs in Flanders.

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