



CHAPTER 11

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Juan Antonio Moreno Murcia and Apolonia Albarracín Pérez

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UNIVERSAL DESIGN FOR LEARNING AND COMPREHENSIVE AQUATIC METHOD IN PHYSICAL EDUCATION

Juan Antonio Moreno Murcia and Apolonia Albarracín Pérez

The integration of Universal Design for Learning with the Comprehensive Aquatic Method allows for inclusive physical education adapted to the diversity of the student body. Both approaches complement each other by facilitating meaningful learning in the aquatic environment.

▶▶▶ Introduction

Contemporary education requires inclusive and flexible pedagogical strategies that respond to the diversity of the student's learning styles, rhythms and contexts. Therefore, in educational centres, and all subjects, this must be implemented, without Physical Education being an exception. In this way, we have to aim for methodologies that support this idea, but that do not just stay theoretical, but that are practical and real.

In this sense, [the Universal Design for Learning \(UDL\)](#) appears, as a set of principles with a solid theoretical basis, which aims to respond to the approaches of diversity, to reach all students, without distinction. Its broad and encompassing nature entails that it can be applied to all subjects and learning contexts, being very fit for use in the field of Physical Education and all contents related to motor competence.



In this way, we relate this resource to aquatic competence, as this must be an integral part of motor competence, and if this is so, it must also be worked on and developed at school. As Albarracín & Moreno-Murcia (2018) established, swimming at school will be the most universal and necessary step to learn to swim safely, aiming to achieve "aquatic literacy" in the entire school population. That is, promoting the development of aquatic competence, understood as a set of skills, knowledge, attitudes and behaviours necessary to interact with the aquatic environment safely and efficiently while considering the unpredictability of the natural aquatic environment as opposed to the facilities in which classes are usually held.

On the other hand, and focusing on the exclusive development of aquatic competence, we find the [Comprehensive Aquatic Method \(MAC\)](#) developed by Professor [Juan Antonio Moreno Murcia](#), which has characteristics in common and suggests paying attention to all students, regardless of their diversity. Therefore, both UDL and MAC are presented as innovative approaches that, when combined, offer a solid framework to transform the teaching of aquatic competence in physical education classes, especially when developing activities in the pool.

➤➤➤ UDL and its applicability in Physical Education



UDL is a pedagogical approach that seeks to remove barriers in the educational process by planning and designing accessible environments for all students. Its fundamental principles are based on:

- 1. Multiple means of representation.** Different ways of presenting information, allowing all students to access content through various channels.
- 2. Multiple means of action and expression.** Various ways to demonstrate what has been learned, adapting to the skills and communication styles of each student.
- 3. Multiple means of engagement.** Options that stimulate motivation and participation in practice, responding to individual interests.

In the case of physical education, these principles make UDL a highly effective model for ensuring equitable access, as it provides learning opportunities regardless of students' cognitive, physical or cultural differences.

The application of this universal design for all learning has been so important in Spain that the education law in force in this country, the LOMLOE (Organic Law 3/2020, of 29 December, amending Organic Law 2/2006, of 3 May, on Education), already states in its preliminary title that: "Among the principles and purposes of education, it includes

the effective fulfilment of children's rights as established in the United Nations Convention on the Rights of the Child, educational inclusion and the application of the principles of Universal Design for Learning (UDL), i.e. the need to provide students with multiple means of representation, action and expression and forms of involvement in the information presented to them".

When it comes to applying UDL in physical education classes, that is, in the planning of tasks or learning situations, it is this same law that states in its Annex III: "Thus posed, the situations constitute a component that, aligned with the principles of UDL, allows learning to learn and lays the foundations for lifelong learning, promoting flexible and accessible pedagogical processes that adjust to the needs, characteristics and different learning rhythms of students and that favour their autonomy".

The LOMLOE in its article 4.3, is concerned with encouraging its use, and represents the DUA, as a commitment to achieve the necessary educational changes to guarantee inclusive and quality education, promoting learning opportunities for all, encouraging all students to have equal access to educational processes, they must be very sensitive to diversity. In this sense, the different rhythms and styles of learning, personal motivations, culture of origin, specific talents, family and social environment, etc., will be considered.

In addition to the LOMLOE, the UDL principles address the Sustainable Development Goals of the 2030 Agenda, specifically "Ensure inclusive and quality education and promote learning opportunities for all" (United Nations, 2018).

Specifically, and for Physical Education, this proposal is very well-founded, because, although it is an eminently practical subject, all tasks have their conceptual and attitudinal part, so that all UDL principles are susceptible to being applied in their three possibilities (practice, concepts and attitudes).

In fact, inclusive physical education is becoming more and more necessary, since years ago some students were "exempt" due to personal situations or pathologies that hindered their mobility, but today everyone must take this subject, thanks to these new approaches and the approach to teaching this area. Having justified in the introduction the belonging of aquatic competence within motor competence, aiming to achieve aquatic literacy, its teaching must be framed within the school environment, specifically in the area of Physical Education, since, as Albarracín and Moreno (2018) point out, this environment represents the most universal space for its development. The UDL facilitates the achievement of this objective, since, from a more inclusive and pedagogical perspective, it allows the traditional content of swimming or the development of aquatic competence to be approached from a safer, more necessary and connected vision with its application in everyday life.

►►► The MAC as an inclusive strategy



The MAC (Moreno-Murcia & Ruiz, 2019; Moreno-Murcia, 2023, 2024; Ortiz et al., 2025) is a pedagogical proposal focused on meaningful learning within the aquatic environment. Unlike traditional approaches that prioritize technical repetition, this method places an emphasis on the student's personal experience, encouraging understanding, exploration, and adaptation to the aquatic environment.

environment. It is based on principles such as guided discovery, respect for individual rhythm and student autonomy. The objective is not only to learn to swim, but to understand and feel water as a space for integral development. This approach seeks to develop aquatic competence, which is based on three key dimensions (Fonseca-Pinto & Moreno-Murcia, 2023):

- **Water literacy.** Understanding of the aquatic environment in its generality, its characteristics and the way in which the student interacts with it.
- **Drowning prevention.** Development of skills, knowledge, attitudes and values that allow self-management of risk and safety in water.
- **Environmental education.** Promotion of a sustainable relationship with aquatic ecosystems, fostering ecological awareness and respect for the environment.

In the search for aquatic competence in physical education, on the other hand, it is intended to promote the complete development of the human being through movement, integrating physical, cognitive, social and emotional dimensions. In this sense, the MAC is directly related to physical education because both share a holistic vision of learning. By putting the student at the centre of the process, decision-making, critical thinking and the active construction of knowledge are favoured, fundamental aspects in current physical education.

Given its flexible and student-centred nature, the MAC naturally aligns with the DUA, allowing in-pool teaching to be inclusive and accessible to all, ensuring that each student acquires a multidimensional aquatic competence, which goes beyond the simple fact of knowing how to swim.

Perhaps one of the points that the DUA and the MAC have in common is the attention

to diversity. Our relationship with water is very diverse and will depend on the previous relationship we have had, which comes hand in hand with the sociocultural level (middle and high levels usually have very early aquatic experiences), family and personal motivations (there are families and people who love water and are interested in the relationship with it). It will also depend on the cognitive and physical level (which will promote an understanding of the conceptual procedures as well as the assimilation of the practical processes that must be carried out to achieve them), on emotional aspects linked to the aquatic environment (possible accidents, complicated situations, life near aquatic environments that favor the relationship with water, etc.), as well as other aspects that may occur naturally or exceptionally.



Points of convergence between the UDL and the MAC

The integration of the UDL and the MAC arises from the coincidence in their key principles: inclusion, adaptability and respect for the diversity of the student body. Among the most relevant points of convergence (Figure 1) are:

Table 1. Points of convergence between the UDL and the MAC.

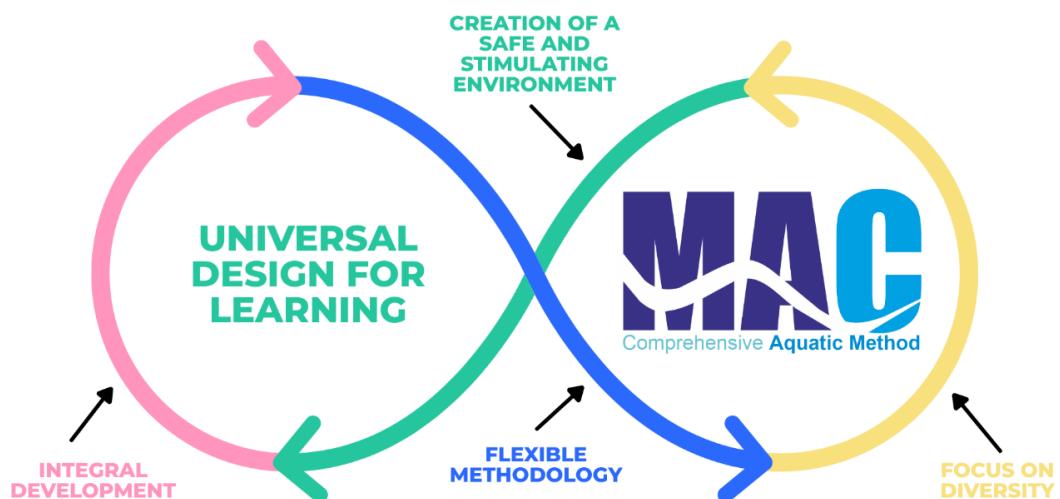
Points of convergence	UDL (Universal Design for Learning)	MAC (Comprehensive Aquatic Method)
Attention to diversity	Promotes numerous ways of representation, expression and motivation	Adapts to the student's individual level
Flexibility in teaching	Diverse learning strategies and resources are offered	Allows different ways of movement and aquatic learning
Focus on motivation and active participation	Considers commitment as a key principle	Games, exploration and autonomy are key
Continuous and formative evaluation	Constant adaptation to the student's needs	Constant observation and adjusting according to the motor and emotional response
Inclusion as a structural principle	Aims to eliminate barriers for all students	Based on active participation without exclusions
Autonomy of the student/learner	Promotes self-regulation and decision-making	Encourages security in the aquatic environment based on self-regulation

- **Flexibility in teaching.** One of the pillars of UDL is methodological flexibility: providing various forms of access to information, modes of expression and ways to achieve learning objectives. This openness is reflected in the MAC through its adaptable structure, which does not impose a single teaching path, but adjusts to the changing needs of each participant in the aquatic environment. From structured exercises to moments of free exploration, the MAC promotes personalised teaching, reflecting the principle of flexibility that underpins the UDL.
- **Attention to diversity.** This approach seeks to respond to a wide range of needs and learning styles, anticipating possible barriers. For its part, the MAC also starts from a person-centred perspective, recognising the uniqueness of each human being in the aquatic environment. Through continuous adaptation to the abilities, emotions and rhythms of each participant, the MAC generates personalised teaching that aligns

perfectly with the philosophy of the DUA.

- **Focus on motivation and active participation.** UDL highlights the importance of commitment and motivation as essential elements for meaningful learning. By fostering personal relevance and a sense of belonging, it seeks to keep students actively engaged. The MAC incorporates these same elements by placing play, curiosity and exploration as central resources in the aquatic experience. In this way, it creates an emotionally positive and motivating environment, based on the satisfaction of basic psychological needs (autonomy, competence and relationship) which is also key in UDL to promote sustained learning.
- **Continuous and formative evaluation.** Evaluation in the DUA is not an isolated moment, but a constant process that allows teaching to be adjusted according to the evolution of each student. Similarly, the MAC is based on the continuous observation of the student's motor, emotional and social behaviour, which enables a dynamic pedagogical intervention. This constant feedback not only allows the activities to be adapted, but also accompanies the individual learning process, reinforcing the coherence between both approaches.
- **Inclusion as a structural principle.** The UDL was created aiming to generate inclusive educational environments by design, eliminating the need for subsequent adaptations. The MAC, in turn, offers an environment in which everyone can participate regardless of age, ability or previous experience in the water. Inclusion is a structural feature, not an add-on, allowing each person to find their place and rhythm. This vision of inclusion connects deeply with the foundations of the UDL.
- **Autonomy of the student/learner.** UDL promotes autonomy as an essential axis, encouraging self-regulation, decision-making and the definition of personal goals. The MAC, on the other hand, promotes autonomy through activities that allow participants to explore the aquatic environment freely, make decisions, solve challenges and develop self-confidence. This active autonomy not only enhances learning but also connects directly to one of the core values of the UDL.

Figure 1. Points of convergence between the UDL and the MAC.



▶▶▶ Benefits of Joint Enforcement

The implementation of UDL in combination with MAC can bring multiple benefits to the teaching-learning process, including:

- **Increased motivation and commitment.** By having multiple forms of access and expression, students become more involved in the activities.
- **Increased perception of security.** Water teaching, when tailored to individual needs, reduces anxiety and bolsters self-confidence.
- **Meaningful learning and skills transfer.** The inclusion of flexible strategies allows students to connect with content and acquire skills applicable in other educational and everyday contexts.

▶▶▶ Practical examples

To facilitate the integration of UDL and MAC in Physical Education classes, the following Table 2 is presented with practical examples of tasks (included within the learning situations) in the pool. It illustrates various contents and objectives, along with differentiated tasks that guarantee the participation of all students. In addition, the principles of UDL applied in each task are highlighted, ensuring that the content is accessible and adaptable to individual needs. Examples of specific MAC games and activities are also included, which favour the development of aquatic competence through meaningful experiences, promoting safety, autonomy and cooperation in the aquatic environment. In fact, it should be noted that the objectives set are always related to the 15 aquatic competencies (Ortiz et al., 2025; Stallman et al., 2017).

Table 2. Practical examples applying UDL and MAC.

Competences	Task examples	UDL principles	MAC example
Aquatic competence of floating	Carrying out different floatations with and without material, adapting the task to the possibilities of the student, reaching a final group composition where different floatations take place.	Numerous methods of action and representation: application of the different floatations to a final composition considering the student's skills. Each student will decide if they need material, which type, and, out of all the options, will advance as far as possible.	In groups, and with background music, doing a composition of movements where floatations in different positions (vertical, ventral, dorsal, mid-water, at the bottom, etc.) are highlighted. The use of material when necessary is permitted, as well as the aid of other flotation materials of the facility (corks, the pool overflow...). At the end, the compositions will be tackled, analysing the limitations, difficulties, aesthetic and music-related actions, etc.

Aquatic competence of propulsion	Carrying out movements with different styles (crawl, backstroke, breaststroke) and using some variants (for instance, sliding with support, adapting the task to the student's skill).	Numerous methods of representation and commitment: adapting to the type of movement and progression according to the student's skill. To adapt to the different levels, you can leave several materials on the pool's overflow, and if the student considers it necessary, they can grab them to help themselves with said movements.	Relay race in the water: students have to move from one side to the other, using different swimming strokes, adapted to their skills. Forming groups and carrying out a previous game chosen by the participants. Each group can choose the lane that they want (some people feel more comfortable closer to the pool overflow, etc.).
Aquatic competence of safe rescue	Simulating situations of prevention and rescue, such as floating in the water in case of extreme tiredness, or using the flotation material appropriately.	Numerous methods of commitment: real simulations of safety and prevention in the water. Establishing different levels of commitment according to the necessities or possibilities, and assigning different roles (one calls the emergency services, another helps, others collaborate on what they are told, etc.) Presenting infographics, signs, etc., that remind them of the main steps of the drowning survival chain.	Aquatic rescue game: a student simulates to be in danger, and their classmates have to help without getting into the water using basic techniques of safe rescue. When the activity is over, and after having changed the roles, leave a few minutes for reflecting and commenting or querying about the difficulties, problems, possible fears, etc.
Attitudinal aquatic competence	Group games in which the students have to move floating objects from one side of the pool to the other, promoting cooperation and communication.	Numerous methods of action and commitment: ludic and cooperative activities that promote the participation of everyone. Distributing several roles and making each student choose those in which they feel more secure. In following repetitions, they can try other roles that entail more difficulties, as long as they want to. Promoting the change of rules and their adaptation.	Aquatic treasure hunt: teams must pick up objects from the bottom of the pool and move them without using their hands, promoting cooperation. Encouraging each student to offer the help that they consider to be appropriate. Favouring the exchange of ideas after the activity is over and analysing the suggestions.

Conclusion

The articulation between UDL and MAC represents an opportunity to transform Physical Education into a truly inclusive and enriching space. By adapting UDL strategies to the context of aquatic education, safety, motivation and the learning of

motor and socio-emotional skills are enhanced. This comprehensive approach responds to the needs of a contemporary education that seeks to ensure the participation and development of all students, regardless of their individual differences.

The scope of application can and should be curricular, but extracurricular is not exempt from these principles. All people must feel included in the achievement of aquatic literacy, and it must go hand in hand with school, for its universalization. However, these principles must be continued outside of it, being of vital importance for the development of comprehensive aquatic competence based on people that the assimilation of the contents and the achievement of the objectives follow the same line of work.

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