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Introducing Wetting Models in Science Club

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Over the last 20 years more inventions have emerged from NanoScience and Engineering (NSE) than any other scientific field (1). By 2030, its implications in regards to science, technology innovation, economy and society are expected to overcome even the ones from the digital revolution. Scientific research and development of technological applications in the nanoscale has provided every field that has been applied to with state of the art achievements. Given the above, the need of NSE's introduction to formal and informal education is clear and imperative. Biomimetics consists of a large ambit in NSE. Even though its foundation ground, which is the transfer of function and design principles from Biology to Technology(2), appeared along with mankind its self, NSE has significantly broaden the horizons of it. Its introduction to education is considered to be of major importance in order to form scientific literate citizenship that will be able to function and make the right decisions under the current circumstances. Non formal education environments are considered to be breeding ground to the communication and development of positive attitude towards science. To this end, in this paper a suggestion for teaching Wetting Models based on the Model of Educational Reconstruction in a Science Club is being presented.

Wetting Models portray the different ways of a surface's wetting and the way the procedure is actually determined by its micro- and nano- roughness. Although a subject rarely encountered among educational interventions about Biomimetics, it provides fundamental context for comprehending phenomena such as hydro- and oleo- philicity and phobicity, the Lotus Effect, the Rose Petal Effect and so on. Their introduction is thus considered appropriate to occur in advance in order to establish a solid theoretical background concerning the aforementioned phenomena.

In the present study the design of a teaching sequence about Wetting Models addressed to Secondary Education is being described. To the means of structuring a specific teaching plan to present the subject with the most advantageous way possible, Educational Reconstruction Model (MER), has been utilized.

Decontextualizing scientific content and recontextualizing it taking into account the characteristics and the factors affecting the learning procedure, has resulted in compiling two teaching units, whose learning goals, association with the 9 Big Ideas of NSE(3), as well as misconceptions expected to emerge, will be presented.

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