

## **Study of a multitrophic integrated aquatic system for the teaching-learning of the subjects physics, chemistry and biology in the bachelor**

Eva Ramirez (1) and Cecilia Espinosa (2)

(1) Universidad Nacional Autónoma de México, Colegio de Ciencias y Humanidades Plantel Oriente (eva.ramirez@cch.unam.mx), (2) Universidad Nacional Autónoma de México, Colegio de Ciencias y Humanidades Plantel Oriente (cecilia.espinosa@cch.unam.mx)

In Mexico exist due to the lack of water in the City, which is where the College of Sciences and Humanities Orient (at UNAM) is located. This is because a point of view from the Chemical, Physics and Biology subjects is important to find learning strategies that motivate students to seek solutions to problems such as these. As Science Mentors, students were asked to propose water treatment from the homes they live in. From these investigations the students concluded that it was necessary to study in depth the wetlands like Multi-trophic Aquatic System that allow the treatment of gray water, so that a prototype of Micro-scale Multitrophic Aquatic System was set up in the laboratory, where the pH was measured, The concentration of oxygen, phosphates, from a Chemical perspective. As for the subject of Biology, we worked on the search for mycorrhizal fungi associated with the growth of plants for the purification of water. In physics we worked the sedimentation system. Artificial wetlands are man-made zones in which, in a controlled manner, mechanisms for the removal of contaminants present in wastewater, occurring in natural wetlands through physical, biological and chemical processes, are constructed mechanically and Is waterproofed to prevent losses of water to the subsoil, the use of substrates different from the original land for rooting the plants and their selection that will colonize the wetland benefit the recovery of water. The present project aims to structure an Artificial Wetland to carry out didactic strategies, activities with students, as well as work on research projects in the sciences of Chemistry, Physics and Biology. Through the application of chemical, biological and physical concepts and processes, so that students of the different semesters of the College of Sciences and Humanities Plantel Oriente, appropriate the relevant knowledge in the area of experimental sciences, developing thinking skills and achieve Significant learning, which are reflected in the training of individuals competent to reflect, value and protect ecosystems and especially wetlands. Due to the above, it was promote the preparation of a Wetland and thus have an area that concentrates the necessary materials to make available to teachers, students and researchers. This tool, opens new possibilities of education to our community, and in this way bring young people to the Experimental Sciences.