



Coastal geology to children through performative arts

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Coastal and marine geology have traditionally been disseminated in science outreach activities in the form of formal presentations and field trips, usually using scientific jargon difficult to understand. The success of outreach actions and education programs requires knowing and understanding different audiences and strategizing how to reach them. So, efforts are kept now in the improvement of science literacy with accurate and appealing techniques that at the same time strengthen the learner's connection with the ocean. Recent strategies fusing arts and science (e.g. using games, poetry, music, painting, sketching) have been particularly efficient in this regard.

The Intergovernmental Oceanographic Commission (IOC) of UNESCO stands that only through Ocean Literacy it will be possible to create an educated society capable of making informed decisions, and caring for the preservation of oceans' health. The objective of this work was to address IOC's Principle 2 of Ocean literacy: "The ocean and life in the ocean shape the features of the Earth", by using performative arts (dance and drama) as an innovative technique of science communication to children.

Within the framework of the outreach task of the research project EVREST (Evolution and Resilience of Barrier Island Systems), an informal education activity called "The Sea Rolls the Sand", focusing on ocean dynamics, was designed for 10 year olds. It combines coastal science concepts (wind, waves, currents, and sand) with creative dance and drama methods (movement, imaginative play, and sensory engagement). A sequence of six exercises was proposed starting in the generation of offshore ocean waves and ending with sediment transport on the beach during storm/fair-weather conditions. The activity consisted of the theme introduction, warm-up, directed exercises, improvisation and relaxing. Exercises were preceded by a simplified but accurate scientific explanation. Scientific concepts were then translated into structured creative movements (with and without props), within imaginary scenarios, and accompanied by sounds or music with easy rhythmical composition.

Tavira Ciência Viva Science Centre, an institution devoted to science dissemination to the general public, facilitated the bridge between researchers and primary schools students. The activity was performed 6 times summing more than 120 students. All students in the class participated, including children with cognitive impairment, attention deficit disorder, amblyopia, light autism, hyperactivity and dyslexia. Most exercises were made with children standing in two lines facing each-other, waiting for their turn to improvise and dance. This alignment allowed students with some degree of impairment to engage in the activity. Children living in coastal areas have limited scientific background on coastal geology, however they have plenty of empirical experience on the coast, associated generally with pleasant feelings, vacations, playing, and freedom. At the end of the activity, inquiries were distributed to obtain an anonymous evaluation of the activity. Results showed that all children enjoyed themselves and want to repeat, and more than 80% liked to learn about science through movement.