

What the VAK with Marine Science?: A Workshop to Put You in Students' Shoes

BY DOMINIKA WOJCIESZEK, KATARZYNA BOROWIAK, AND ROBERT ROCHA

During the 2016 European Marine Science Educators Association (EMSEA) annual conference in Belfast, Northern Ireland, in the midst of a series of presentations and workshops that were focused primarily on efforts to bring the concept of Ocean Literacy to European institutions and general public, a workshop was presented that was meant to educate, motivate, and entertain. This workshop, called What the VAK? (Visual, Auditory, Kinesthetic) with Marine Science—A Multisensory Approach to Marine Education, literally had everyone in the room out of their seats participating actively in the dual role of teacher and learner.

This presentation was so engaging and so easily adapted to any presenter's locale that I strongly encouraged the leaders of this workshop, who work for the Akwarium Gdynskie (Gdynia Aquarium) in Poland, to bring this workshop to the 2017 NMEA conference. So, with support from their aquarium and scholarships from NMEA's Expanding Audiences funds, Dominika and Katarzyna were able to attend our conference this summer and present What the VAK? As expected, the session was exceptionally well-received and gave attendees some new ideas and tools for teaching adaptations, classification, and interaction among species.

I was quite excited to have them join us in Charleston, and now I am equally pleased to have them share some of the back story of the creation of this program, the setting in which they work, and the feedback related to this specific program that they have received from teachers who have brought classes to their aquarium.

-Robert Rocha



FIGURE 1. Education through play for students ages 4-6, at the Gdynia Aquarium.

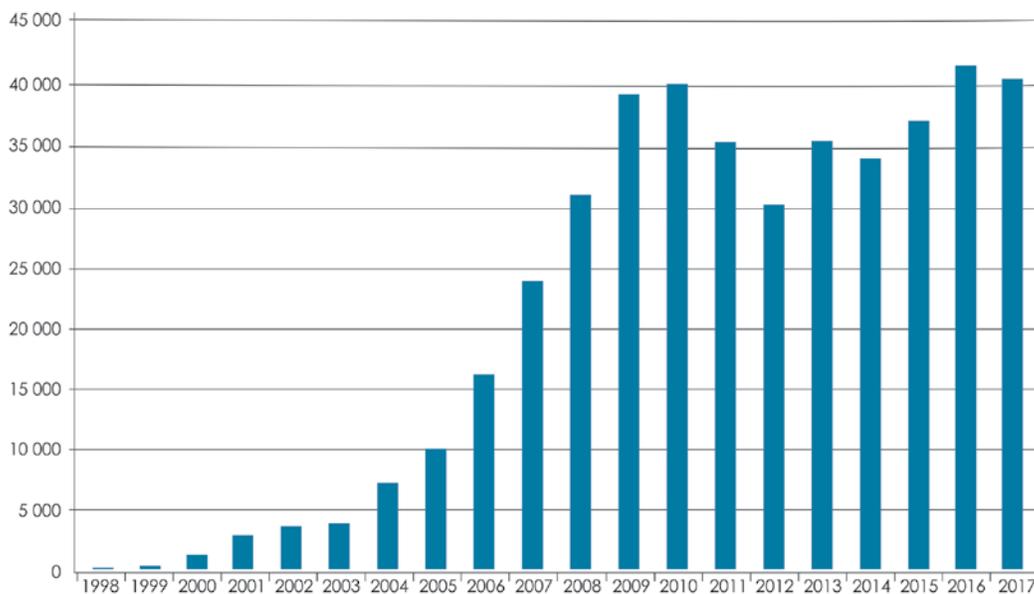


FIGURE 2. Number of students attending classes at the Gdynia Aquarium since 1998.

The Gdynia Aquarium is quite an unusual zoological garden, located in northern Poland, on the coast of the Baltic Sea. The exhibit is focused on the aquatic environment and presents four major world biotopes: coral reefs, coastal zones, dense rainforests of the Amazon, and the Baltic Sea. The zoo owes its long traditions associated with the collection and display of aquatic fauna and flora to being a part of the National Marine Fisheries Research Institute—the oldest marine research unit in Poland. Nonetheless, our mission is not only to present the natural environment, but also to impart scientific knowledge. With the above in mind, in 1998 the Gdynia Aquarium established the Education Center. Since then, students from Gdynia as well as school groups from all over Poland have participated in numerous workshops and educational projects. The main goal of its activity is to educate as many young people as possible on the current issues of biology, ecology, and the protection of the marine environment. There are about 40,000 people each year taking part in those phenomenal lessons (Figure 2). What is crucial for educators is to modify scripts of the classes according to the age of the participants. As a result, lessons are extremely diverse in the forms in which they are designed: multimedia presentations, demonstration lessons, workshops, laboratories, hydrographic cruises, education through play, and movie screening (Figure 1). The educators work with all age groups:

preschoolers, teenagers, students, teachers, seniors, and others, like customs officers. Varied also are the educational spaces used. The Education Center conducts classes in five well-equipped rooms, a nearby marina, and an exhibition at the Gdynia Aquarium.

In terms of all this, and as employees of the Education Center in Gdynia Aquarium, we admit, it is quite a challenge to be marine educators. Every hour, we teach a different age group in a different location like a kindergarten class in a laboratory, auditorium, exhibition, or outdoors. There is another challenge: how do we grab the attention of those young people, if they are glued to their mobile phones? We decided to create a series of interactive tasks based on participants' senses, which are now tapped during our classes. *Touch, see, hear and experience!* is the motto of the Education Center. In our view, the main goal of an educator is to stimulate student imagination by inspiring them to be active. We engage students by using the VAK method.

Although, the VAK (visual, auditory, kinesthetic) learning styles approach is widely discussed or even controversial, it still provides us with a broad set of tools that help marine educators at the Gdynia Aquarium reach and educate large groups of visitors. Understanding how complex a learning

process is, as well as how diverse students' abilities are, we decided our classes should be designed in such a way that they engage most senses in the teaching-learning process, and help the educators effectively pass their knowledge on to diverse audiences. All our classes provide a visual presentation of animals and/or processes discussed; accompanied by a story from our educator; sound effects such as animal sounds; as well as kinesthetic experience in the form of a drama for young kids, and hands-on experiments or microscopic observations for older students.

This method was employed in all our education activities, including outdoor events such as Baltic Sea Protection Day; Festival of Biodiversity etc.; and in-house classes offered for our two biggest externally-funded projects, Gdynia and Sopot. The latter are environmental education programs funded by the City of Gdynia and the City of Sopot for students attending schools in their respective cities. Each class within those programs is followed by a survey filled out by a teacher accompanying students during their trips to the Aquarium. In both cases, the teachers were very satisfied with the results of the programs and considered it very engaging for students. Many of them pointed out that the program is especially engaging for students who do not perform well in a traditional school environment that is based on textbook learning with very little visual or kinesthetic experience.

Encouraged by positive responses from teachers, and the general success of our approach, we decided to share our experience with other informal educators and developed a workshop. The goal of the workshop is to put the participants into students' shoes and show how difficult it may be to learn, if the teaching style is not tailored to your learning needs. To achieve this goal, the workshop breaks down the learning experience into separate senses: visual, auditory, and kinesthetic. It consists of three tasks, each focused on one of the three senses, and a summary. Each participant receives a worksheet on which each task is explained and additional materials are available and described.

I SEE SEA: VISUAL PRESENTATIONS IN MARINE EDUCATION

The first task tests a participant's visual abilities. The task is based on a bingo game and requires the participant to make a connection between information on a worksheet and pictures presented by the workshop leader. On the worksheet, the participants have 20 pictures of household objects or terrestrial animals whose names or shapes relate to some popular sea creatures such as a cucumber, star, or a clown (Figure 3). As the exercise starts, photographs of 20 sea creatures relating to those objects, with their names, are displayed on the screen. Each picture is displayed for seven seconds. No sounds or comments are provided by the workshop leaders. The participants' task is to cross off the appropriate pictures of their worksheet as the animals' photographs appear on the screen.

Visual presentation of information, whether it is a picture of an animal, a graph, or any other depiction of an issue, usually reaches most of the audience successfully. The same is true for the first part of the workshop and this first task is usually the easiest for participants. However, the workshop shows that not all participants are able to complete the task. Even though we cannot conclude whether it's caused by some external factors, based on our observation of participants, we believe that for some of them it is due to a lack of additional clues, like commentary on the animal's name or behavior.

I HEAR SEA: DOES THE AUDIENCE UNDERSTAND WHEN WE TALK?

The aim of the second part of the workshop is to show how hard it is to understand any topic when it's being explained only with words without any visual cues. In this task, participants draw a sea animal following just verbal instructions given by another workshop participant. Participants don't know what type of an animal they are drawing. The sea creature consists solely of geometric shapes such as triangles and circles (Figure 4). The instructions also consist solely of information about shapes and their localization on the sheet. The participant giving instructions to his or her peers is also



FIGURE 3. Examples of drawings that participants find on their worksheets with matching photographs of sea creatures.

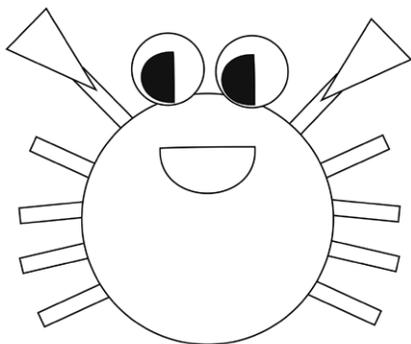


FIGURE 4. An example of a sea creature to be drawn in the second task of the workshop.

instructed not to use gestures while describing the picture. This part of the workshop is consistently the hardest. At least half of participants have difficulty understanding instructions that are not accompanied by any visual representation of the object they're drawing. Many of them give up halfway through the task, and very few complete the drawing to look exactly like the original picture. In our opinion, this exercise shows most clearly how difficult it is to explain something with just words, and how easy it is to lose your audience with prolonged verbal explanations that are not supported by any other material such as a picture, video, or hands-on practice.

I BECOME SEA: USING YOUR BODY IN TEACHING MARINE SCIENCE

The last part of the workshop refers to involving the educator's body in the story he/she is telling or giving the audience some hands-on experiences. This can be in the form of microscopic observation, holding and seeing an object they're learning about, or in the case of the task, telling the story with your own body. The latter was inspired by our experience with our youngest students at the Gdynia Aquarium. For groups ages four to six, we provide classes in the form of a drama in which the children are required to become certain animals. This class received very good reviews from the teachers of these young students, so we adapted them for use in our workshop.

The task is based on charades. Participants in groups of two to three people "perform" a food chain. Each group takes an envelope with an example of a food chain (Figure 5) and is given three minutes to prepare. Each participant becomes one animal in the chain, while the audience is guessing what animals are in the food chain. After "the performance," pictures of the animals in the trophic chain come up on the screen for comparison.

This task, even though intimidating for some of the participants in the beginning, brings good results in terms of audience engagement as well correct answers about food chain compositions. In our opinion, this last part shows exactly how important it is to establish a good relationship with your audience and work more as one group, rather than as two separate parts—teacher and students.

A SUMMARY: APPLYING VAK IN YOUR TEACHING

At the end of the workshop, all participants are required to do a short "teaching session" with the use of all three modes of presenting—visual, auditory, and kinesthetic. Each participant draws a short (two sentence) description of a sea creature with its photograph. Their task is to say something about the animal and show its behavior or a characteristic feature. For the convenience of the workshop, the leaders offer to display a picture of the animal on the screen or the participants can try drawing it on a flip chart (Figures 6 and 7).



FIGURE 5. An example of a food chain to be performed by a team of two participants.

The workshop was created as a story of our experience at the Gdynia Aquarium teaching large and diverse groups of students. Even though it was based on a very simple concept and designed more as a game than a workshop, it is always enjoyed by both the participants and workshop leaders. Educators who took part in the workshop saw it as a valuable source of useful techniques and inspiration to bring back to their own classroom. Even more importantly, students who are taught using these methods are more engaged in the learning process and, according to their school teachers, perform better compared to traditional school classes.

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FIGURE 6. Workshop summary at EMSEA Annual Conference in Belfast—participants learning about European flounder. Courtesy of G. Niedozytko



FIGURE 7. Workshop summary at NMEA Annual Meeting in Charleston—participants learning about whale fin flapping. Courtesy of K. Borowiak