

## The time period before humans. An Educational Program of the Natural History Museum of Philekpaideftiti Etaireia

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In the present work, an attempt has been made to highlight the contribution of the Museums of Natural Sciences to the teaching of the Geosciences through designing and presenting an educational program whose subject is derived from the field of Geology and specifically from Palaeontology and Historical Geology, aiming at understanding the geological time and its comparison with historical time. For this purpose, three different models of depicting geologic time have been designed, for the construction of which participated a group of pupils. In addition, an attempt of designing 3d visualization of microfossils and 3d printing is presented.

### Introduction

The knowledge gained in informal learning environments is particularly important (Hann & Jackson 1995), taking into consideration the fact that in such environments there is a change in attitudes to the subjects under study, psychomotor skills are developed and the social interaction between the team members is promoted (Ioannidou et al 2002) Thus, school teachers choose visits to museums when they think that they are linked to curriculum subjects and are educationally relevant to the pupils' age.

Several museums try to make their educational programs be directly linked to the school curriculum (Allard & Boucher, 1998). This cooperation can be achieved at various levels, such as the complementary level where the museum complements school education. (Koliopoulos, 2005)

The Museum of Natural History of Philekpaideftiti Etaireia is considered to be a Museum of this type, which is located within the area of the Arkakeia Schools in Psychiko. The aim of this Museum is to make the Museum become a school and its target is to offer knowledge through experiential education programs which are linked to the curriculum of the subjects, depending on the pupils age and as it is suggested by the Analytical Program of Studies (Tripolitsiou et al., 2018)

The educational program presented in the present work is entitled: "The Time period before humans", and was designed and carried out in this Museum. The program which is still in progress takes place in 3 stages and so far it has been attended by 250 students aged 9-15 years as well as individual adults.

### Methodology

Prior to the design of the educational program " The Time period before humans ", a survey had been conducted among 450 students concerning pupils of the 4th grade of primary school to the 2nd grade of Senior High School who responded to a question about the geological time on the geologic time scale, in order to collect data on whether students are able to understand geological time.

The objective questions we have posed based on the results of geological time research are as the following:

- What are the mental representations of the students in relation to geological time, how do they perceive it?
- What is the relationship between geological and historical time?
- Can the participants categorize the fossil organisms into basic categories? (bivalves, gastropods, corals ..)
- After completing the training program which they attended, which ideas do they express about fossils, and geological time?

**Table1: Teaching Model**

<b>Before</b>	Classroom	Preparation	Submit Study Subject	Was the form of the Earth always the same as we see it today?
<b>During</b>	Museum	Implementation	Subject study and data collection	Attendance of Educational program - knowledge enrichment and activities. Collection of data in the Museum
<b>After</b>	Classroom	Extension	Analysis and synthesis	Discussion and knowledge building

In this training program, the Allard & Boucher, (1998) & Paquin (1995) teaching model is applied (Table 1).

In addition to this teaching model, the Pre-Post teaching model is also used, according to which the participants fill in a questionnaire before starting the program and the same one immediately after its completion in order to record the students' initial ideas on the theme of geological time.

### **Description of the program**

Initially, the students at the Museum fill in a questionnaire aiming at recording their initial ideas on fossilization and understanding of geological time.

Then through interactive presentation and fossilization models they learn about fossils and the ways of fossilization. Furthermore, there are activities based on experiential learning aiming at the identification and classification of fossils. For this purpose, models of depicting geological time have been designed for the acquaintance and understanding of the geological ages, giving emphasis on the Phanerozoic Eon. The students observe the fossilized exhibits of the Museum and examine fossils that belong to the museum exhibits as they are able to touch them. In addition, by using geological time models, participants try to understand the minimal time as compared to the duration of geological time.

With the help of a group of seven students, enlarged 3-dimensional models of microfossils have been designed using computer programs aiming at getting students to get acquainted with the fossils, since they can touch and observe them in a better way.

### **Conclusions**

The final questionnaire as well as the students' comments show that there is a positive response to the program and an understanding of geological time depending on the pupils' age. The older the age the better and the understanding of geological time.

An unexpected positive outcome is that the students are impressed with the extent of geological time and are concerned about the impact of human activities on the environment during the time of human existence on Earth.

### **References**

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