

The Science Fair at the 2nd Primary School of Avgorou as a Means for Developing Investigative Skills

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Abstract. This is a report of the investigative work undertaken by upper elementary students of the 2nd Primary School of Avgorou at Famagusta in Cyprus, in order to participate in a school science fair during the school year 2004 – 2005. The science fair was organized in collaboration with the Learning in Science Group at the University of Cyprus in the context of the ongoing research program: “The Science Fair as a means for developing investigative skills in elementary school”. The curriculum used for the purposes of the science fair aimed to the development of investigative skills through a sequence of formal, informal and non-formal learning activities.

Keywords. Investigative work, formal, non-formal and informal ways of learning, science fair.

1. Introduction

During the last decade, a lot of efforts aiming at the development of curriculum for preparing students participated in a scientifically literate and technologically dependent society as future citizens were made by educators and researchers, respectively [4]. The coordinated program: “The Science Fair as a means for developing investigative skills in elementary school”, is implemented by the Learning in Science Group at the University of Cyprus, as an attempt for providing special importance on the development of investigative skills in the context of learning science [1].

The curriculum designed for this research program purposes on the promotion of student's inquiry through a sequence of formal, non-formal and informal activities. According to this approach, science fair is the final stage of a long process, where students undertake authentic investigations related to simple questions of their

interest. They work collaboratively to implement an investigation in which they design experiments, collect data and formulate answers. The whole process culminate in a specially organized school event (*the science fair*), during which children display the procedures and results of their investigations and also engage in interactive activities that they have designed in collaboration with their parents in order to teach certain aspects of their investigation to visitors.



Figure 1. Which factors influence the dissolution of substances in water?

2. The Science Fair at the 2nd Primary School of Avgorou

The 2nd Primary School of Avgorou, at Famagusta in Cyprus, is located in an agriculture area. Families' livelihood is mostly related to cultivation and hence, parents most of the times are regarded as unqualified to support their children's learning. Children's interests and experiences are, thus, much different than school's expectations.

The need to engage students in activities that are close to their interests and to give parents the opportunity to get involved in the learning process has gained special importance during the school year 2004 - 2005 at the 2nd Primary School of Avgorou. For this purpose, the educators of the school regarded Science Fair as an activity, suitable for giving motives to students to get involved with investigations related to their interests and developing school and parents' partnerships.



Figure 2. Which factors influence planting?

Totally thirty-six (36) 6th-graders and forty-one (41) 5th-graders were involved in the activity, which was organised into three parts.

The *first part* implemented during November 2004. Students participated in a teaching intervention, which took place in a formal classroom setting. A handbook for teachers and a student's workbook, drawn from the research program mentioned above, were used for the purposes of the formal teaching intervention [1, 3, 5].

Two months later, after the teaching intervention, students were called to participate voluntarily in a school science fair. This was the *second part* of the intervention. In the first place, a catalogue of suggested topics was given to pupils. They had to choose a topic of their interest and work collaboratively to formulate investigative questions related to it. Pupils could also suggest a different topic, other from the given list. The

number of questions they could formulate depended on the topic they have chosen, as well as group's qualification.

As soon as they formulated several investigative questions, they had to design and conduct valid experiments and describe their procedure in an investigations' booklet [2]. They, also, created posters for displaying their methods and results and designed interactive activities in order to teach certain aspects of their investigation to visitors at the science fair. During this part of the activity (informal way of learning), students interacted with other students, their teachers and their parents in preparation for their participation in the science fair. The website of the research program was useful at this phase [5].

Totally twenty two (22) groups, consisted of 2 to 4 students, were engaged in investigations of different topics. The students investigated factors that influence for example the evaporation, the friction, the growth of plants, the balance of bodies, the number of oscillations in the clock pendulum and the hydrostatic pressure. For the purposes of some of the investigations, students had to construct models using materials of daily use (e.g. telephones, music bottles). In other cases, such as the investigation of factors that influence stability of hands, they had to make a machine that could measure hand's stability with the use of electricity.



Figure 3. Which factors influence the distribution of sound in telephones made from materials of daily use?

Many of the parents expressed their interest in getting informed about science fair in order to be able to support their children's efforts. Hence, the teacher organized a meeting with them during this part of the activity.

When all the investigations were accomplished, a special day was chosen for organizing the event (17th of March 2005). The students made an invitation for that purpose. Parents, educators, students from other schools of the district and general public were invited at the Science Fair.



Figure 4. The invitation

The day of the Science Fair is the *final part* of the activity. Students interacted with the visitors within non-formal conversations in the context of their investigations. During this day, the students presented their experimental procedures and their results to public. They, also, engaged visitors in interactive activities they organized in order to teach to them aspects of their investigations.

A parallel contest was running during the Science Fair day, between the visitors. In every group, students were giving points to visitors, as an award for their involvement in the investigation. The visitors were trying to collect as many points as they could.



Figure 5. Which factors influence sinking of bodies in fluids?

3. References

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