

## **Crafting a Health Science Education Program for Primary Schools in Italy**

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### INTRODUCTION

The epidemiological profile of the Italian population, in line with that of many other countries, is characterized by a progressive increase of demographic and health indicators, such as:

- *life expectancy at birth;*
- *average age of the population;*
- *prevalence of degenerative pathologies and chronic illnesses;*
- *prevalence of affluent-type pathologies* (e.g., obesity, cardiovascular diseases, drug dependence, work-related or accidental injury), which are strongly linked to an unhealthy lifestyle (e.g., overeating or unbalanced diet, sedentary lifestyle, stress, tobacco dependence, consumption of psychoactive substances).

The above mentioned increased lifespan causes the Italian population to become, at the same time, more fragile from a health perspective, due to the growing number of people requiring medical attention (e.g., the aged, disabled, chronically ill). Within the framework of national programs aimed at containing the costs of medical treatments, activities to prevent the onset of diseases resulting from unhealthy lifestyles represents the best strategy for a healthy life in the long run. The promotion of healthy behaviours is generally considered one of the fundamental components of primary prevention. Initiatives aimed at encouraging healthy lifestyles (health education) are currently being carried out at the primary school level as recommendations and guidelines. This approach has proved to be of limited effectiveness since health education initiatives, often carried out on a sporadic basis, are perceived by the child as imposed rules, as he is missing the scientific knowledge that is essential to understanding the educational message.

It appeared, therefore, appropriate to promote and begin an educational program on health sciences targeted to primary school with the objective of creating awareness and knowledge, at an elementary level, of the structural and functional organization of the body. The project appears to be a necessary pre-requisite to health education programs and will allow children to acquire, at an early age, correct and healthy lifestyles.

Compulsory school at the primary level represents a unique opportunity for addressing a large audience of students in their initial educational program. In addition, it is well known that the fundamentals of knowledge are established at a very early age.

In this context - with the financial support of Fondazione Roma Terzo Settore for the first year and of the InterAcademyPanel (IAP) and the InterAcademyMedicalPanel (IAMP) for the second year - a five-year project entitled "*Assessment of Feasibility for a Health Education Program in Compulsory Primary School*", aimed at developing an IBSE-based health science education program at the primary school level has been developed by a multidisciplinary group (SCIESA group) composed of: a morphologist and project coordinator (M.S.), a biologist and elementary school teacher (B.M.), an epidemiologist

(A.C.), a child neuropsychiatrist (F.C.), a cell physiologist (G.S.), an expert in science education in primary school (S.C.).

## GENERAL OUTLINE OF THE TEACHING PROGRAM

First phase (learning to read the book of nature: structural and functional organization of the human body). This phase of the program, aimed at first and second year primary school children, is designed to let them become aware of the essentials of structural and functional organization of the human body through 'direct observation' (*perceptible anatomy*). Teachers have to take into account personal experiences and intuitive ideas to promote discussion and cooperative work with children. In this first year, and in the following ones as well, the teaching mediation will be aimed to support processes of reflection and social re-elaboration of knowledge.

Second phase (learning through an experimental approach the fundamentals of functional anatomy). During this phase (third and fourth grade), topics previously treated will be further developed. Additional awareness and knowledge will be added through the implementation of simple "hands on" experiments, as well as by sharing with them simple but relevant results of the scientific research. Teaching methods for meaningful learning are going to be enriched with a variety of teaching aids and strategies such as audio-visual media, drama, etc.

Third phase (knowing the risk factors and countering them). The third phase of the program (fifth grade) is expected to conclude the course by moving from health sciences to *health education*. A scientifically correct knowledge of risk factors and unhealthy behaviours, aimed to improve personal well-being, is generally regarded as a fundamental condition for the active defence of health and a necessary component of all initiatives for primary prevention.

## METHODOLOGY

Specifically, the pedagogical approach will be based on two fundamental, basic strategies: inductive methodology and interactive teaching. This involves:

- active participation and involvement of students during the educational process;
- the use of evidence-based science education strategies;
- a didactic approach based on students' daily experiences, rather than on conventional teaching methods;
- the collaboration with the children's families during all of the program activities;
- a very early start of teaching (first year of the cycle), in order to encourage as soon as possible the interest of the students towards the environment, the functioning of the body-mind system and to expand their knowledge in favour of well-being and health.

## PRELIMINARY RESULTS

Primary school in Italy is for the duration of five years and begins when children are six years old. Four 'first grade' classes from two schools afferent to the *Istituto Comprensivo L. Settembrini*, via Sebènico, Rome (on the whole, 78 six year old children and 8 teachers), were engaged in the project. Teaching activities started on September 2013.

*Three teaching modules have been used:*

- First module: *'Us and the Environment'* (the relationships between the child and the physical and social environment in which he/she lives).
- Second module: *'The human body and the movement'* (i.e. the movement in relation with the musculoskeletal system and the general conformation of the human body).
- Third module: *'Relationships and bodily exchanges between the individual and the environment'* (what goes in and what comes out). The module is divided into two sections, dealing with " *the journey of the air* " (respiratory tract) and " *the journey of food and beverages* " (digestive tract), respectively.

*Production of teaching support materials.* A specific evidence-based program, developed for each module, has been discussed with the teachers. Appropriate teaching aids (tool kit) produced by the SCIESA group have been provided to the teachers.

*Training of the teachers.* Training of the teachers. The eight teachers involved in the project participated in a preliminary two-day training program aimed at improving their abilities on evidence-based teaching; monthly meetings with members of the SCIESA group were focused on the evaluation of the work done, the revision of the designed teaching units and the operational aspects of the inductive method. Additional training has been programmed at the beginning of the second year of the project.

*Evaluation of results obtained.* The first year of the project was completed in late June 2014. Evaluation of the results, based on records that teachers have taken on a "day-by-day diary" and on "self-evaluation sheets" prepared for each teaching module, is in progress. Class activities aimed to assess the ability of children to ask questions, to argue and to provide evidence of what they say, will also be planned. The involvement of the pupils' parents will be considered through specific questionnaires.

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