

## Abstract

In order to improve the quality of science teaching it is important to get children's previous conceptions, having also in mind the possibility to increase the motivation for the teaching and learning process. By giving special attention to children's initial conceptions, it is given a high role to their way of constructing their own knowledge, being also an active person integrated in the society where daily experiences are taken from. The aim of the present study on *Digestion/Excretion in Primary School: Children's conceptions, learning obstacles and strategies to overcome them, and 20-21st textbooks analysis* is to identify children's previous conceptions, their learning difficulties and obstacles in Digestion/Excretion as well as to propose an innovative teaching methodology with the aim to overtake such obstacles. School textbooks were also analysed in order to be able to associate or not some features leading to didactical obstacles as well as to know the evolution of Digestion presentation along the last and the present century.

The methodology was developed in three interrelated moments of action. In the first moment (A) questionnaires and interviews were used to collect primary school children's data. The second moment (B) concerned, on one hand, the practical application of a innovative methodology of teaching and learning based on different representations and interpretations of both Digestive and Urinary apparatus (Experimental Class), having in mind the learning difficulties and obstacles that emerged from the previous moment, and on another hand, carrying out in parallel the traditional teaching methodology (Control Class), both in school year 2. The third moment (C) involved the analysis of 50 primary school textbooks of different periods (1920-2003) with the aim to study the didactic representation of Digestion along the time and to identify possible didactic obstacles in the current textbooks that might influence the correct understanding of the structure and function of the Digestive apparatus, relating them with the previous moments.

It was possible to verify from the moment (A), following the analysis of the questionnaire answers concerning the childrens's drawings, four categories related to the human body ("Tube", "M-S", "SnL", and "CE") for the year 1 and 2, *i.e.* before the formal learning. After the formal teaching (year 3) new categories emerged ("Cont" and "Inc"), which were also observed in year 4. In the moment (B), the results obtained in both the

Control Class pre-test and pos-test showed no differences whereas in the Experimental Class the pre-test was similar to both pre- and post-tests of the Control Class but the Experimental Class post-test showed new categories as a result of the enriching and significant learning. In the moment (C) four groups were created (map I, II, III and IV) to analyse the textbooks. It was found that different publishers showed different evolutions and different didactical problems that vary in relation to both the number of occurrences and the level of severity. Thus, the results show that the school textbooks, on one hand, have been losing scientific and didactical qualities with time and, on the other hand, have been presenting a positive evolution as far as design and aesthetics is concerned.

This work has a special value as it not only makes an approach to the children's conceptions and learning difficulties but also is a challenge to understand more deeply the significance and the responsibility that teachers play in the process of teaching and learning as motivators of the knowledge acquisition, who use frequently the school textbooks.