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TEACHING METHODS THAT CAN BE APPLIED TO FORM CONCEPTS OF NATURAL SCIENCES

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Abstract

The purpose of this paper is to highlight the possibility that teacher have to apply observation, laboratory experiment or practical work in the lessons in which begins the formation to the schoolchildren of the concepts of natural sciences, in primary school. To achieve the purpose of our investigation, we analyzed the content of programs and textbooks developed for the "Mathematics and exploration of the environment", and "Natural sciences", respectively, in terms of suggesting the application of the three previously mentioned teaching methods during lessons. According to the content of curricula, research has shown that observation and practical work are suggested to be used as teaching methods by the teacher during lessons conducted since preparatory class to the fourth class. Laboratory experiment is first mentioned in the content of curriculum developed for the first class. It is often suggested the application of observation directed by the teacher in learning activities, in the form of short-term observation (during a lesson), both as observation which does not need to be repeated, and observation that should be repeated. That observation can be guided by teacher through observation sheets. Based on the content of textbooks, our research has shown that the observation and practical work are indicated to be applied to a greater extent than the laboratory experiment.

Keywords: Concepts; natural sciences; observation; practical work; laboratory experiment; primary education.

1. Introduction

The scientific content of disciplines "Mathematics and exploration of the environment" and "Natural sciences", studied by students in the preparatory class and 1st - 4th grades, contain numerous concepts of natural sciences. They may be classified according to the following criteria:

1. "Depending on the ability of perceiving through the senses, there are concepts/notions:

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- concrete (concrete – which may be perceived by the senses; real): dog, chicken, butterfly, leaf, pear, heart, magnet, electricity, forest, etc.;
- abstract (abstract – that is imperceptible to the senses): state of aggregation, metamorphosis, life cycle, environmental factor, adaptation, energy, solar system, universe, etc.;

2. Depending on the two basic logic elements of the concept (content – all objectual characteristics contained in the concept, and domain/sphere – all objects and phenomena that refer to the content notes), there are concepts/notions:

- with richer content and broader sphere: fir, wolf, deer, clay, iron, aluminium, river, lake, snow, cloud, dew, frost, rainbow, etc.;
- with a more restricted contend and greater sphere: conifers, carnivores, herbivores, soil, metal, water, natural phenomena, etc.;

3. Depending on the sphere, there are concepts/notions:

- individual: grape, cherry, tomato, carrot, cat, dolphin, horse, carp, perch, etc.;
- collective: fruit, vegetable, mammal, butterfly, fish, etc.;

4. According to the level of generality, the concepts/notions can be:

- of great generality: plant, animal, universe, body, etc.;
- of smaller generality: fruit tree, domestic animal, solar system, living body, non-living body, etc.“ (Petruţa, 2015b, p. 299).

According to the curricula of the two aforementioned disciplines, developed in 2013 or 2014, learning contents in which there are found these concepts belong to areas: Life Sciences, Earth Sciences and Physical Sciences.

Within the integrated activities undertaken to discipline “Mathematics and exploration of the environment” at the preparatory class, 1st grade and 2nd grade, students begin to form some concepts of natural sciences. In some cases, formation of these concepts can be completed by the end of 4th grade, for example, the concepts of “domestic animal”, “wild animal”, “tree”, “fruit tree”, “vegetable”, “living environment”, etc. In other cases, formation of concepts will continue and will end when the students will acquire the full definition from the scientific point of view, within the lessons of Biology, Chemistry and Physics, held in the gymnasium or sometimes in high school, for example, the concepts of “flower”, “mammal”, “bird”, “skeleton”, “water”, “air”, etc. (Petruţa, 2015b, p. 300).

As considered by Todor, Bărbuleanu & Burtea, at the pupil of school age “the psychological process of formation of representations and concepts about nature run through, at individual level, two stages”. The first is called “the preparatory phase of concept” and the second “the phase of consolidation of concept” (Todor, Bărbuleanu & Burtea, 1988, 19-20). The authors point out that the first stage are formed in students the perceptions and representations of concrete objects, and subsequently, based on them, the concepts. They also mentions that it is necessary to use as many ways of knowing, recalling: the direct contact with objects and phenomena, indirect contact, through models, objects and phenomena, and contact through the word.

“By the contents which follow to be learned by school children, according to the curriculum, it is aimed at precise cognition of the content of different concepts of natural sciences, and also to their progressive enrichment, from a grade to another” (Petruţa, 2015a, p. 690).

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To select the most appropriate teaching methods, as part of the teaching strategy applied within the lesson, in order to form / develop correct concepts of natural sciences, the teacher must consider, on the one hand, that the thinking of students up to the age of 10 years has a global intuitive character, and on the other hand, what kind of concept - concrete or abstract, is going to be formed in students within a teaching activity, as well as the knowledge relating to that concept, learned earlier by the students.

2. Paper Theoretical Foundation and Related Literature

According to the opinion of Iancu Ciobanu, it can be said that "the results achieved in the education process is due mainly to the didactic methods used, respectively to the teaching methods used by the teacher and those of learning used by the students" (Iancu Ciobanu, 2009, p. 268). Skutil, Havličková & Matějičková, referring to the teaching method, mention that "is an effective way of organising and guiding learning, a common way of procedure that unites a teacher's and a students' efforts" (Skutil, Havličková & Matějičková, 2016, p. 2). Taking this aspect into consideration, the teacher should "possess a repertoire of methods as large as possible", as stated Cerghit, because "there are no good or bad methods, but appropriate methods, well or badly used" (Cerghit, 2006, p. 51). Choosing for one method or another rests with the teacher and depends on his/her competence, i.e. of "his/her ability of pedagogical reflection and analysis of situation at that moment", as the previously mentioned educator pointed out. Among the methods that can be used during lessons to young schoolchildren, we will present next only three, as follows. (Cerghit, 2006, p. 39).

Observation is one of the methods commonly selected from the range of methods that can be applied in teaching activities carried out with the students in order to start formation or development to them of natural sciences concepts. It is often used by students to explore the surrounding world, because it favors "a multimodal perception, obtained by multi-sensory channels, and the data obtained are subjected to personal reflection, the subject being no longer obliged to follow necessarily the thinking way of an adult" (Cerghit, 2006, p. 199).

It is "the main method that enables immediate access to the knowledge and exploration of the environment" (Fătu, Stroe, Stroe, Cîrstoiu, & Ciolac-Russu, 2008, p. 55). Through this method, "the students perceive directly, actively and systematically the objects and phenomena of surrounding reality, in order to better know their essential traits; they describe and explain the acquired data by reference to the known notions; they integrates the new knowledge into the overall knowledge already assimilated" (Todor *et al*., 1988, p. 24).

Observation carried out by the students on organisms, and on various natural processes and phenomena, can be short or long, or can be repeated. It shall be directed / guided by the teacher with questions or through worksheets. Only this way, guided step by step, the students will reach the results expected to be obtained from the process of observation. By applying this method, the teacher will follow the gradual development of the spirit of observation to students. Csengeri & Iacob, emphasizes the importance of conversation made based on intuitive material aiming at observation by students of the essential characters of the organisms or phenomena studied (Csengeri & Iacob, 1961, p. 73).

Observation "is correlated with multiple teaching methods, especially with the laboratory experiment, in which case the observation becomes proceeding" (Petruţa, 2009, p. 120).

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Another method used in the lessons of "Mathematics and exploration of the environment" and "Natural sciences" is the practical work. "It is a method of learning, especially practical knowledge, through which the students carry [...] activities already known, under the guidance of teacher, with the purpose of a thorough knowledge of some work techniques" (Iancu Ciobanu, 2009, p. 288). Students will have to carry out "precise workloads, which always lead to an accurate, exact result, both when applying theoretical knowledge in practice, and when aiming at the formation of some practical skills" (Petruţa, 2009, p. 160). This method is sometimes confused with the laboratory experiment. Therefore it should be mentioned that the laboratory experiment is a method by which students are encouraged to formulate and verify hypotheses, process and interpret data, develop arguments pro and con, and to draw conclusions, and the result obtained by students may vary (several versions can be obtained). These steps are missing when using practical work in teaching activities.

Practical works can be carried out by the students frontal, in groups or individually, whether they are simple practical works, or can be demonstrated by the teacher to the whole class, if they are difficult to realize.

Laboratory experiment is "a fundamental method when aiming to acquire knowledge in biological sciences, favoring direct participation of students to rediscover the scientific truths" (Petruţa, 2010, p. 123). As mentioned by Fătu *et al*., "it involves challenging activities, restoration and alteration of some phenomena and processes in order to study them" (Fătu *et al*., 2008, p. 57). According to different criteria, there are several variants of this method, among which we recall the following:

a. After the didactic purpose pursued, are distinguished: demonstrative experiment, application experiment, experiment designed for the formation of motor and research skills;

b. After the mode of student's organization, there are: frontal experiment, experiment performed in groups and individually;

c. After the place where is carried out, it can be: experiment performed in the classroom, experiment performed in the school's experimental field or in the environment;

d. After duration, are distinguished: short-term experiment, and long-term experiment;

e. After the mode of performing, there are: real and virtual experiment (Petruţa, 2010, p. 123).

The teacher can apply the laboratory experiment any time during a mixt lesson. Fătu *et al*. pointed out the need for close supervision by the teacher of how the students perform the experiment, and the possibility of suggesting what the students cannot find themselves, without substituting their personal effort of discovering the new knowledge (Fătu *et al*., 2008, p. 59).

As we have mentioned previously, the laboratory experiment can be confused with the practical work, and sometime with the experience, as specified by Iordache, Leu, & Ion (2004). The mentioned authors pointed out that the experience consists only in "practical verification of a law or formula by triggering phenomena in the laboratory", while the laboratory experiment is a research method (Iordache *et al*., 2004, pp. 104-105).

The methods mentioned above have an important role in the formation / development of proper concepts of natural sciences to students, given that they "are formed through gradual interiorization of

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practical and verbal actions, up through the schematizations and ways of working mentally" (Zlate, 2006, p. 208).

3. Research Problem and Objectives

Given the relatively recent emergence of the new programs for disciplines "Mathematics and exploration of the environment" (2013) and "Natural sciences" (2014), through our research we were aiming to highlight the possibility that the teacher has to apply observation, practical work or laboratory experiment in the lessons with which begins the formation of concepts of natural science to students in primary school/education. In conducting the research we considered the following objectives:

- highlighting observation, practical work and laboratory experiment, as methods recommended for the formation of environmental concepts, in school curricula developed for the preparatory class and 1st - 4th grades;
- identification of concepts for the formation of which the teacher can apply the methods mentioned previously, in lessons conducted in the preparatory class and 1st - 4th grades, based on content analysis of the textbooks;
- highlighting the teaching method primarily applied in lessons for acquiring by the students of the scientific content of the concepts of natural sciences, in the preparatory class and 1st - 4th grades.

4. Research Setting, Design and Methods

In this research, we used the method of analyzing the curricular documents. To achieve the proposed purpose, we analyzed the content of programs developed for the disciplines "Mathematics and exploration of the environment" and "Natural sciences", in terms of suggesting the application of observation, practical work and laboratory experiment during lessons. We also analyzed the content of alternative textbooks of "Mathematics and exploration of the environment" and "Natural sciences" developed for the preparatory class and 1st - 4th grades, in order to identify the concepts of natural science for which formation to the students are used the three teaching methods mentioned above.

5. Results and Discussion

Analyzing the content of the curriculum developed for the preparatory class at the discipline "Mathematics and exploration of the environment", it appears that the observation is the method most frequently mentioned for acquiring by the students of knowledges about nature or to correct them, if necessary. For example, "the differentiation of seasons, two by two, depending on the specific characteristics observed", "observation of some changes occurring in humans, animals, and plants life, depending on the season", "observation of the component parts of living things (plants, animals) for identifying their common structure", "watching a seedling growth, keeping under observation one of the factors that maintain life", "direct observation of some of plants, insects, etc in their natural environment (M.E.N, 2013).

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In 1st grade, the observation is one of the didactic methods mentioned in the curriculum, being proposed the following learning activities: "establishing, through observation, of the main structures of animals and plants", "comments on the changes of water (solidification, ice melting, evaporation, boiling, condensation)" (M.E.N, 2013). Even if the method name does not appear specified too often in the curriculum, observation can be applied in numerous lessons for students to recognize different organs of plants, animals or humans, based on images from atlases or molds, to recognize the role of the Sun as a source of light and heat, to identify from a series of pictures with animals those that meet two conditions simultaneously (for example, animals with internal skeleton and two-legged; four-legged animals that eat only grass, etc.), or to establish relationships between the structure of various organs and the roles of these.

Observation is not mentioned in the content of curriculum developed for 2nd grade, but will be applied as a teaching method within the investigation. Between the learning activities in which the investigation will be used, we mention the following: investigation of a natural or artificial living environment (pool / aquarium, forest / park, etc.) to identify plants and animals that inhabit it, the living conditions and adaptations to the environment; investigation of the needs of some living organisms using movie clips in order to generalize the characteristics of living things; investigation of the forces exerted by magnets on other magnets or magnetic materials, highlighting the N and S poles and attraction / repulsion between opposite / identical poles", etc. (M.E.N., 2013). This method will be applied by the teacher within the lessons aiming at giving the students the ability to recognize, for example, presentations of some living environments in drawings / pictures / layouts / documentaries, or planets of the Solar System on drawings / simple models / or in documentaries. It will be also applied when students will learn to correctly describe different plant or animal organisms, or when they will identify certain aspects of nature, for example, changes in plants, animals, and human's life, as a result of day-night cycle, or the effects of sounds intensity and loudness on living creatures.

According to the curriculum, in 3rd and 4th grades will be followed the valorization of students' ability to carry out observations in order to study the environment. By correlating these activities with various everyday activities and practical problems, will be stimulated the students' curiosity, and by creating an investigational approach the students will find answers to various questions (M.E.N, 2014).

In 3rd grade, the application of observation is suggested in the following learning activities: "observation of some bodies and the identification of their characteristics (eg living organisms to identify the component parts, various objects to identify some properties, such as shape, color, transparency)", "conducted/ guided observation of some simple sketches, drawings to identify the stages of phenomena / processes (eg water cycle)", "observation of some dynamic aspects of the surrounding reality or more distant to the known living environment, by watching some movies or by performing of some role-playing games (for example, about the movement of water on Earth's surface)", "making comments on the issue investigated (eg observation of the color of leaves, the growth momentum, the orientation of plants, etc)", "observation of the effect of pollution on some organisms by demonstrative experiences (eg regular watering of a plant with lemon juice, simulating the acid rain)" (M.E.N, 2014).

In the case of realization of some observations within various experiments or practical works under the form of experiences, observation becomes didactic process. For example, when students are asked to observe: the appearance of plants kept in different environmental conditions for a certain

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duration; how plants contribute to the water cycle; the formation of waves and water currents following the simulation of these movements of water; water cycle in nature; the trajectory and duration of falling for various objects; how an object can be removed without being touched (M.E.N, 2014).

In 4th grade, observation is often mentioned in the curriculum. Analyzing the curriculum content, we can say that observation will be applied as a didactic method within the model devices method, practical work and experiment. Thus, for teaching is suggested "the use of some models for observing the relationships between the components of a system (e.g., use of charts, slides representing different life environments to observe the relationships between conditions offered by them and the appearance of the living beings)". Also, will be performed the following learning activities: "guided observation of some simple sketches, drawings, highlighting the relationships between the components of a system (e.g. the establishment of some simple food chains, diagram of an electrical circuit)"; "observation of some dynamic aspects of surrounding reality or furthest from the living environment, by watching movies or performing of role-playing games (e.g., movement of the planets of the Solar System); observing some phenomena and processes by conducting simple experiments"; "carrying out some periodic observations on the researched aspect (i.e., observation of soaking seeds with water, cracking of the tegument, occurrence of the new plant) (M.E.N, 2014).

As specified in the curriculum, the teacher can guide the observation activity of the students through worksheets. Thus, the students may be required to complete periodically "observation sheets with information about phenomena and processes from the environment". For example, in 3rd, they will describe periodically the variations in the color of the leaves of two plants, and in 4th grade they will describe regularly the changes observed to every seed placed on wet paper towels to germinate (M.E.N, 2014).

Another method that can be selected and applied in order to transmit knowledge about nature provided in the curriculum, is practical work. In the preparatory class, teacher may ask students to conduct simple practical works of plant care in the classroom, even if this method is not mentioned in the curriculum content. Thus, will be achieved two learning activities: "tracing the growth of a seedling keeping under observation one of the factors that maintain life" and "counting a plant' flowers / leaves which occurs within one week, in order to emphasize its growth" (M.E.N., 2013).

Practical work is first mentioned in the content of curriculum developed for the 1st grade, being about practical works under the form of some experiences. Thus, it is stated precisely carrying out of the following experiences in order to make obvious: "water status changes (solidification, ice melting, evaporation, boiling, condensation)"; "gravitational force: free fall of various objects"; "propagation of sound through various media which alters its loudness". Also, there is mentioned the development of "practical activities of maintenance of the green area in the schoolyard or classroom green corner" (M.E.N., 2013)

In 2nd grade, both practical work and observation can be applied as teaching methods within the investigations mentioned above. According to the curriculum content, practical work under the form of some experiences can be applied in lessons as a teaching method when will be carried out "simple experiences highlighting air movement" and "experiences that highlight the movement of the Moon around the Earth / the movement of a satellite around a planet" (M.E.N., 2013).

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According to the curriculum developed for 3rd grade, practical work is often recommended to be applied in the lessons of Natural Sciences, and the number of experiments (13) proposed to be carried out is much higher compared to those specified in the content of previous school programs. It mentions the possibility of simple experiences to highlight "the differences between the different sources of water"; "the movement of water on the surface of the planet"; "the changing of the state of aggregation of water and its relationship with the temperature"; "the air movement and the influence of wind on clouds", and "the interactions between bodies and their effects" (M.E.N, 2014).

A slightly smaller number of simple experiments (12) is stated in the content of curriculum developed for 4th grade. It is suggested the possibility of carrying out some simple experiences to highlight: "floating of various bodies"; "some properties of the water in different states of aggregation"; "dissolution of solids and influence of temperature"; "some optical phenomena". It is indicated, also, to carry out simple experiments "for achieving some mixtures and for their separation", "for demonstrating heat transfer between objects" and "for constructing simple electrical circuits" (M.E.N., 2014).

Another method envisaged in the research is the laboratory experiment. Analysis of the content of curricula shows that simple experiments are first mentioned for 1st grade, being recommended to the teacher for "highlighting forms of energy" (M.E.N., 2013). In 2nd grade, the experiment is mentioned only once, as a learning activity where the aim is "to highlight the intensity / loudness of sound" (M.E.N., 2013). According to the programs developed for grades 3rd and 4th, it is recommended the deployment during each semester of at least one experiment that respects scientific research stages, and which must be age-appropriate for the students. It is recommended to carry out experiments to observe how a plant reacts to different environmental conditions (light / dark, water / dryness, different soil types), in 3rd grade. For the next grade are mentioned experiments that would highlight the influence of environmental conditions on sprouting / germination of the seeds (M.E.N., 2014).

Table 1 shows the result of analysis of the content of lessons existing in some alternative textbooks of "Mathematics and exploration of the environment", developed for preparatory class and 1st – 2nd grades, and those of "Natural sciences" published for 3rd – 4th grades, regarding the possibility of selecting and applying by the teacher of observation, practical work and laboratory experiment, in order to initiate formation and development of the concepts of natural sciences to the students. To elaborate the synthesis presented in the table, we have identified the concepts of large and smaller generality, using the textbooks of "Mathematics and exploration of the environment" prepared by Burţilă, Chiriac, Dumitru, Coţofană, & Grigoraş (2013) for preparatory class, Dumitrescu, Ciobanu & Birta (2014a) and Dumitrescu *et al*. (2014b) for 1st grade, Dumitrescu *et al*. (2014c) and Dumitrescu *et al*. (2014d) for 2nd grade, and respectively the textbooks of "Natural sciences" published by Piţilă & Mihăilescu (2005) for 3rd grade, and Piţilă & Mihăilescu (2006) for 4th grade.

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Table 1. Observation, practical work, and laboratory experiment – methods that can be applied in order to form the concepts of natural sciences during primary education

Class (grade)	observation/ concepts	practical work/ concepts	Laboratory experiment/ concepts
preparatory	plant, woody plant, fruit tree, herbaceous plant, root, stem, leaf, flower, fruit, seed, vegetable, season, animal, domestic animal, wild animal, head, trunk, leg, wing, bird, domestic bird, migratory bird, insect, planet, star, human body, heredity	growth environmental factors	
1st	plant, woody plant, fruit tree, herbaceous plant, root, stem, leaf, skeleton, brain, heart, lungs, stomach, kidney, star, energy source, light, heat, day, night, form of energy, electricity, season, tree, water, forest, pond, water cycle	stem, gravitational force, boiling, condensation, evaporation, freezing, melting, energy source, light, heat, sound	environmental factor, germination, sound, noise
2nd	universe, solar system, star, planet, plant, woody plant, fruit tree, herbaceous plant, root, stem, leaf, flower, fruit, seed, vegetable, animal, domestic animal, wild animal, mammal, bird, living environment, North Pole, South Pole, water, Black Sea, lake, pond, pool, desert, forest, Danube Delta, atmosphere, landforms, plain, hill, mountain, hygiene, food, physical exercise	day, night, planet, satellite, adaptation, air, magnet, electricity, electric circuit	sound, noise
3rd	natural material, processed material, mammal, bird, fish, reptile, insect, skeleton, limb, upper limb, lower limb, internal organ, heart, lung, stomach, kydney, human body, head, neck, trunk, health, diet, hygiene, energy source, species, nature reserve, protection, environment, waste	body, living body, non-living body, solid bodies, liquid bodies, gaseous bodies, state of aggregation, root, stem, flower, fruit, seed, heart, sense, sense organ, soil, substance, mixture, dissolving, separation, decantation, filtration, water cycle, evaporation, condensation, solidification, melting, air, day, night	leaf, fish, stimulus, reaction, water cycle, environmental condition
4th	living environment, terrestrial environment, acquatic environment, spontaneous plant, cultivated plant, vegetable, fruit tree, feeding relationships, forest, decidous tree forest, coniferous forest, mixed forest, pond, polution, delta, cave, sea, ocean, life cycle, growth, development, metamorphosis, water, soil, fuel, food resource, solar system, star, planet, satellite	reaction, defensive reaction, adaptation reaction, volume, mass, measuring instrument, units of measurement, substance, density, metal, magnet, electric circuit, light source, rainbow, state of motion, state of rest, force, gravitation force, pulling force, heating, cooling, rusting, decay, alteration, ripening, burning transformation	environmental factor, germination

Analyzing data from the table is found that within the concepts of natural sciences are included concepts of biology, chemistry, physics, astronomy and geography.

Based on analysis of data from the table, it can be said that observation can be applied to a very large extent in the preparatory class, for the formation of 93.10% of the concepts identified. To a large extent, this method can be used in 2nd grade and 1st grade, in case of 78.00% from the concepts, and 64.28% of concepts, respectively. In 4th grade, the observation can be applied for the formation / development of more than half (50.84%) of concepts, and 3rd in grade, to a slightly smaller extent, i.e. 44.77% of the concepts, respectively.

Practical work can be applied to a limited extent in the preparatory class (6.89% of concepts), in 2nd grade (18.00% of concepts) and 1st grade (26.19% of concepts). In the following grades this method can be used to a greater extent. Thus, in the 3rd grade and 4th grade it can be used for understanding and assimilation of the content of 46.26% from the concepts, and 45.76% from the concepts, respectively.

The laboratory experiment can be used for the formation of the concepts of natural science to a small extent, compared with observation and practical work. The possibility of applying this method is

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slightly higher in the 1st grade and 3rd grade, compared to other grades. Thus, the laboratory experiment can be applied in the case of 9.52% of the concepts identified in 1st grade, respectively 8.95% of the concepts that must be formed in 3rd grade. It can be used in 2nd grade only in the case of 4% from the concepts, and in 4th grade it can be used to a very limited extent, i.e. 3.38% from the concepts.

6. Conclusions

In primary education, through the study of disciplines "Mathematics and exploration of the environment" and "Natural sciences", the students begin to form and to develop to themselves different concepts of natural sciences. Within these concepts are included those of biology, chemistry, physics, astronomy and geography. In the case of other concepts, their formation to the students is completed at the end of the 4th grade. Other concepts are repeated, corrected and enriched continuously throughout primary education. Their formation will continue at secondary school, during lessons of biology, chemistry, physics and geography. For the formation of the concepts of natural science, the teacher may choose the method of observation, practical work and laboratory experiment, from the suite of methods that can be applied in teaching activities carried out with the students. According to the content of curricula, observation is recommended to be applied in the learning activities carried out since preparatory class, up to 4th grade. Practical work can be applied to preparatory class as plant care activities in the classroom, and in the next grades under the form of some experiences. Compared with observation and practical work, the experiment is suggested to be fully applied to a small number of learning activities, since the 1st grade. The analysis of the content of textbooks has shown that observation is the most recommended method for understanding and learning by students of the scientific content of the concepts of natural science in primary education, especially in the preparatory class and 1st – 2nd grades. Practical work is suggested to be applied in lessons, in 3rd – 4th grades, to about the same extent as observation. Laboratory experiment is rarely recommended to be applied in learning activities carried out in the two disciplines studied during primary education.

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