

TEACHING METHOD FOR INTRODUCTION TO NATURE AND SOCIETY AND STUDENTS' SUCCESS

(Lesson – What is soil?)”

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Abstract

Education theorists agree that all of the current school reforms have been largely restricted to external changes including reforms of the curricula, changing the length of schooling, changes in school organization, changes of instructional goals and objectives and the like. No reform of education has been more deeply involved in reforming education so far, and it is our duty now to put this in the foreground. Changing the curriculum is the foundation from which a new basis of the teaching process further grows out that move the role of teachers and students and remove forever all the modes in which the student is passivized. Reforms... we all want them, but we are often not aware of what they bring along.

This paper deals with the issue of shaping and applying innovative models in the teaching of teaching methods for introduction to nature and society in the conditions existing in our schools. Most teachers need a modern methodical transformation of program contents for teaching nature and society. Therefore the theoretical part of the work is directed towards the consideration of innovative approaches in Teaching methods for introduction to nature and society, which asked for an indication of the theoretical basis for starting with the selected models, comparison of the traditional and the modern concept of teaching nature and society, pointing out the most important items and the underdeveloped competences of teachers and students for modern teaching practice, as well as the elaboration of those learning and teaching strategies that are underrepresented in today's teaching of nature and society, and which are necessary if we want to increase the level of students' success.

Key words: Teaching methods, nature, innovative models, competences, teaching, students.

Introduction

Reforms,... we all want them, but we are often not aware of what they bring along.

Teachers in pedagogical and didactic theory come across general guidelines for innovation of teaching, such as: instruction should not be conceived for memorizing facts and concepts, definitions and phenomena, but to respect individual differences among students, and to enable students to develop their knowledge independently etc. But such requirements induce no response if they are not seen and reshaped into precise and specific methodological guidelines aimed at the actual program content, Milutinovic, (2006). The introduction of innovation will be facilitated by providing complete teaching materials that will help teachers to apply these innovations in practice more easily. The application of modern educational technologies does not involve only the modernization of schools with new and modern teaching aids, but it also gives clear instructions for delivering active forms and methods in the context of current curricula. The teacher must know how to combine modern methods, forms and methods of teaching, i.e. what the advantages and disadvantages of such models are, and in which frameworks they can be successfully applied in our teaching practice, Sidenco, (2006).

In the attempt avoid generalized didactics and out of desire to leave strict methodology which can easily turn into routine and bare practice, the basic idea was to show the ways in which innovative models of teaching organization are formed in teaching the subject Nature and society studies, i.e. the effect they have on the students' success, or which dimensions the teacher has to take into account in order to meet the framework of the contemporary teaching of nature and society studies. Previous requirements constituted the basis for designing innovative models of learning in teaching Introduction to nature and society in the third grade for this job. The aim is to demonstrate innovative models of learning, from the initial idea to the final shape, with special emphasis on limiting circumstances during application, the conditions for their success, as well as their empirical confirmation by measuring the success of the student.

Intentional causes for writing this paper lie in the fact that in our teaching practice there are extremely rare empirical studies that aim to check the success of the application of contemporary models of learning and teaching, in junior elementary school. Schools and education within the European Union offer their own proposals for modernizing of the teaching in our schools, but only as examples and ideas that need to be upgraded to suit the conditions of our teaching practice. Models of

learning and teaching for teaching the subject Introduction to nature and society that will be suggested in this paper rely on the achievement of the teaching practice and the compatible subject in the European Union under the title "Science" and "Primary science", but tailored to the requirements of the teaching program for the subject Introduction to nature and to the application conditions in our schools, Костовић, (2006).

METHODOLOGICAL FRAME OF THE RESEARCH

The main problem of this research is how to make modern teaching of the subject *Introduction to nature* more efficient. This subject has interdisciplinary character and its basis lies in an even more complex subject. Most teachers find *Introduction to nature* difficult in all teaching activities, from planning and modeling to evaluation of the student.

The subject of this research is theoretical and practical study of students' achievement by applying innovative models in teaching nature and society. Students' achievements with the application of innovative models of teaching will be studied based on learned knowledge, habits and skills of students about nature and society in junior elementary school.

GOALS AND TASKS OF THE RESEARCH

The goal of the research is to establish the effects on students' success that resulted from the application of the experimental program (innovative models of work in teaching nature).

A special goal of the research is aimed at shaping innovative models of work based on the experimental program in teaching *Introduction to nature* in the third grade of elementary school.

On the basis of the objectives it is necessary to realize the following research tasks:

1. To collect data on overall students' success and the success in nature and society;
2. To perform an initial testing to see how much of the program contents of nature and society in the experimental and control groups are learned.

HYPOTHESES OF RESEARCH

Based on the theoretical approach to the problem, the goal and the task of this research the following starting hypotheses are formed:

Basic hypothesis (X₀) and alternative hypothesis (X_a) are as follows:

(X₀) It is assumed that the application of innovative teaching models for *Introduction to nature* will have no impact on increasing students' success, increasing the quantity and quality of knowledge, as well as on the increase of students' interest in the learning contents from the field of nature.

(X_a) It is assumed that the application of innovative teaching models for nature will facilitate students' success and increase students' interest in learning contents from the field of *Introduction to nature*.

RESEARCH TYPES

The planned research is operational and developmental. The research is oriented towards modifying and improving the immediate educational practice in the third grade of elementary school.

The research focused on studying the teaching of *Introduction to nature* in the present, as well as in the future.

Balancing groups per overall success variable at the end of the first half

For the intended pedagogical experiment it was necessary to consider the overall success of the students of experimental and control groups at the end of the first half of third grade, because the experiment was done in spring, i.e. in the second half of the same grade.

Tab. 1: Overall students' success at the end of the first half of the school year of the fourth grade

| Name of school | Class | | No. | Excellent | | Very good | | Good | | Satisfactory | |
|-----------------------------|-----------------|----|------------|------------|-------------|-----------|-------------|-----------|------------|--------------|------------|
| | | | | Бр. | % | бр | % | Бр. | % | Бр. | % |
| "BrakaMiladinovci"- i"- | IV ² | E1 | 28 | 20 | 71.43 | 3 | 10.71 | 3 | 10.71 | 2 | 7.14 |
| | IV ³ | E2 | 26 | 19 | 73.1 | 4 | 15.4 | 2 | 7.7 | 1 | 3.8 |
| "Nikola Karev"- | IV ¹ | E3 | 27 | 22 | 81.5 | 3 | 11.1 | 1 | 3.7 | 1 | 3.7 |
| | IV ² | E4 | 28 | 21 | 75.0 | 3 | 10.8 | 2 | 7.1 | 2 | 7.1 |
| Total E group | | | 109 | 82 | 75.2 | 13 | 11.9 | | 7.4 | 6 | 5.5 |
| "BrakaMiladinovci"- i"- | IV ¹ | K1 | 29 | 21 | 72.4 | 5 | 17.3 | 2 | 6.9 | 1 | 3.4 |
| | IV ⁴ | K2 | 26 | 18 | 69.3 | 6 | 23.1 | 1 | 3.8 | 1 | 3.8 |
| "Nikola Karev"- | IV ³ | K3 | 29 | 22 | 75.9 | 5 | 17.3 | 1 | 3.4 | 1 | 3.4 |
| "Nikola Karev"- | IV ⁴ | K4 | 28 | 20 | 71.5 | 4 | 14.3 | 2 | 7.1 | 2 | 7.1 |
| Total K group | | | 112 | 81 | 72.3 | 20 | 17.8 | 6 | 5.4 | 5 | 4.5 |
| Total K and E groups | | | | 190 | 73.8 | 33 | 14.9 | 14 | 6.3 | 11 | 5.0 |

The overall success at the end of the first half of the school year is expressed based on the number and the percentage of students with excellent, very good, good, satisfactory and unsatisfactory success, and on the mean grade of the classes for the experimental and control group, and for each class separately, and is given in Table 1.

Based on data from Table 2 it can be concluded that the experimental and control groups balanced according to the number of students with positive success (E – 75.2%, K-72.3%) and negative success (E – 5.5%, K – 4.5%). Group E has a slight advantage in the number of students with excellent success (53.2%) compared to group K (59.0%). In the category of very good success the students are well balanced.

Tab. 2: Overall students' success at the end of the first half - of the school year of the third grade for Introduction to nature

| Name of school | Class | | No. | Excellent | | Very good | | Good | | Satisfactory | | Total positive | | Total negative | |
|-----------------------------|-----------------|----|------------|------------|-------------|-----------|-------------|-----------|-------------|--------------|-------------|----------------|-------------|----------------|------------|
| | | | | N | % | N | % | N | % | N | % | N | % | N | % |
| "Braka Miladinovci" | IV ² | E1 | 28 | 13 | 46.4 | 8 | 28.6 | 2 | 7.1 | 5 | 17.9 | 28 | 100 | 0 | 0 |
| | IV ³ | E2 | 26 | 16 | 61.5 | 5 | 19.3 | 3 | 11.5 | 2 | 7.7 | 26 | 100 | 0 | 0 |
| "Nikola Karev"- | IV ¹ | E3 | 27 | 15 | 55.6 | 7 | 25.9 | 4 | 14.8 | 1 | 3.7 | 27 | 100 | 0 | 0 |
| | IV ² | E4 | 28 | 14 | 50.0 | 6 | 21.4 | 5 | 17.9 | 3 | 10.7 | 28 | 100 | 0 | 0 |
| Total E group | | | 109 | 58 | 53.2 | 26 | 23.9 | 14 | 12.8 | 11 | 10.1 | 109 | 100 | 0 | 0 |
| "Braka Miladinovci" | IV ¹ | K1 | 29 | 17 | 58.6 | 5 | 17.2 | 2 | 6.9 | 3 | 10.4 | 27 | 93.1 | 2 | 6.9 |
| | IV ⁴ | K2 | 26 | 15 | 57.7 | 6 | 23.1 | 2 | 7.7 | 2 | 7.7 | 25 | 96.2 | 1 | 3.8 |
| "Nikola Karev" | IV ³ | K3 | 29 | 18 | 62.1 | 7 | 24.1 | 2 | 6.9 | 2 | 6.9 | 29 | 100 | 0 | 0 |
| "Nikola Karev" | IV ⁴ | K4 | 28 | 16 | 57.1 | 8 | 28.6 | 3 | 10.7 | 1 | 3.6 | 28 | 100 | 0 | 0 |
| Total K group | | | 113 | 66 | 59.0 | 26 | 23.2 | 9 | 8.0 | 8 | 7.1 | 89 | 97.3 | 3 | 2.7 |
| Total E and K groups | | | 221 | 124 | 56.1 | 52 | 23.5 | 23 | 10.4 | | 8.6 | 218 | 98.6 | 3 | 1.4 |

If we analyze the overall school success of classes the following will be observed: while E group as a whole leads in the number of students with excellent success, K3 control class has most excellent students (62.1%). The experimental class E4 has the least excellent students (61.5%). In the category of very good success the experimental class E2 has only 19.3% of such students, compared to E1 and E4, which have 50.00% of students with very good success. The experimental group has only one student with satisfactory success (1.22%), while the control group does not have any students with such success. From the stated above, we see that the classes are very diverse in structure, which in junior grade school is not uncommon.

Tab. 3 Innovative models in the teaching of the subject *Introduction to nature*

| | |
|----------------------|---|
| MODEL | |
| TEACHING TOPIC | What is soil? |
| TEACHING UNIT | Soil is made up of living and nonliving things |
| CLASS TYPE | Presentation and review (2 classes) |
| CLASS GOALS | Systematization of the acquired knowledge of living and nonliving things and the introduction of new criteria for identify the components of soil |
| CLASS TASKS | |
| a) educational | Expanding the students' knowledge about soil. Learning the new way of living and nonliving things, and components of soil. |
| b) educationally | Development of students' team work and achievement of mutual cooperation. |
| c) functional | Enabling students to distinguish components of soil |
| TEACHING METHODS | A) verbal – textual: the oral method (dialogue), the method of the written word (work on a text); B) illustrative - demonstrative: illustration with paintings and drawings, demonstrations of natural materials; C) method of managing pupils' independent work (long-term experiments) D) Observing, communicating, comparing, categorizing, relating. |
| TEACHING FORMS | Group, frontal. |
| TEACHING AIDS | Computer, LCD projector |
| TEACHING TOOLS | Teaching books, paintings, natural material, tweezers, magnifying glass |
| STUDENTS' ACTIVITIES | Research, mini-project, recording, evaluation, grouping, asking questions, reporting, asking questions |
| FORMS OF LEARNING | Participatively, cooperatively conceived. |
| CLASS ARTICULATION | 1. Preparation task: How does mold develop? 2. Students' reports about the task done. |

| | |
|--|--|
| | <p>3. Group work.</p> <p>4. Groups' reports.</p> |
| <p>METHODICAL GUIDELINES (Preparation)</p> | <ol style="list-style-type: none"> 1. Make a transparency and then duplicate the "Soil Chart" 2. Make a transparency of "What is soil?" 3. Obtain 6 cups of sand. Place one cup of sand in a container and label it "A". Set aside another cup of sand for "Motivation". 4. Obtain 5 cups of topsoil from such places as a garden, field, or along a fence. Place one cup in a container and label it "B". Set aside another cup of topsoil for "Motivation". 5. Obtain five cups of potting soil, which can be purchased from a garden shop. 6. Obtain ten cups of school ground soil, but not from a garden area. <p>MATERIALS</p> <ol style="list-style-type: none"> 1. For 'Motivation' – one cup of topsoil, one cup of sand 2. For "Separating soil" – several sponges and /or towels, quart jar with lid, white glue and paper. 3. For "Determining that soil contains water" – paper towels, jar, potting soil, piece of plastic wrap 4. For "Observing soil" – for each group – metal tablespoon each of soil "A", "B", and "C", newspapers to spread in group's working area, at least two magnifying lenses. 5. For "Application" – jar of water, rock, empty jar with lid, leaves or grass clippings, toy insect, plant, transparency, "What's in soil?" |

Preparational task: Separating soil!

Have students compare the difference between topsoil and sand. List these on the board, for example:

| <i>Topsoil</i> | <i>Sand</i> |
|-----------------------|-------------------------|
| <i>Wet</i> | <i>Dry</i> |
| <i>Moist</i> | <i>Light</i> |
| <i>Dark</i> | <i>Scratchy feeling</i> |
| <i>Crumbly</i> | <i>Falls apart</i> |
| <i>Stays together</i> | |

Tell students that they will have an opportunity to figure out a way to separate soil into its parts. Then do the following:

You need: A transparent container (cup with lid), one-fourth cup of potting soil, one or two magnifying lenses, a strainer or piece of screen, a coffee filter, a teaspoon, paper towels, blunt-ended tweezers, and one cup of water.

Allow students several minutes to explore with the magnifying lenses. Instruct students to separate the soil into different components or parts.

Procedure: They can do their own demonstrations using two tea-spoons of oil, their transparent container with lid, and about one-half cup of water. Student can stir the soil and water instead of shaking their jars.

The difference between the subjects of experimental and control groups with respect to the results achieved at the final test - subtest ii

Tab. 4. Testing differences found in E and K groups on subtest of understanding of the final test

| | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|-----------------------------|---|-------|------------------------------|--------|-----------------|-----------------|-----------------------|---|--------|
| | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | Lower | Upper |
| Equal variances assumed | 1.205 | 0.279 | -5.621 | 159 | 0.000 | -2.97 | .612 | -3.985 | -2.015 |
| Equal variances not assumed | | | -5.502 | 159.22 | 0.000 | -2.89 | .623 | -3.975 | -2.023 |

With Levene's test it was obtained that $F = 1.205$ and $p = 0.199$ are not statistically significant, indicating that variances of subpopulations in terms of the dependent variable are homogeneous. The applied t-test for equal variance, $t = -6.023$ with a significance of $p = 0.00$ was statistically significant, indicating that there are differences between the groups. The experimental group averaged a higher score on the subtest of understanding for 2.89 points compared to the control group. The limits 95% confidence interval for the arithmetic mean of difference does not include 0, which also indicates the existence of differences between groups.

Based on the presented results the hypothesis X2.0 is rejected and X2.a alternative hypothesis is accepted as follows: 'The differences between the subjects of experimental and control groups with respect to the results achieved at the final test - subtest II, are significant because some respondents of the experimental groups solve some of the tasks better.'

Previous results also showed significant improvement of respondents in the experimental group participants regarding the application of knowledge in nature studies included in the research. Unlike them, the respondents of the control group showed no improvement in knowledge application, which states that the selected model of teaching in the control group does not prepare students sufficiently for the application of knowledge in the nature studies. In contrast, it is possible to conclude that the experimental program conditions the development of the ability to implement the knowledge of nature studies.

On the basis of previous results the null hypothesis X0 that says: 'It is assumed that the application of innovative teaching models of nature and society will have no impact on increasing students' achievement, raising the quantity and quality of knowledge, as well as increasing students' interest for learning the content from the area of Nature and Society studies' is rejected and the alternative hypothesis Xa that reads: "It is assumed that the implementation of innovative models of teaching nature and society studies will enable increase in students' achievement, improvement of the quality and quantity of knowledge, as well as increase in students' interest in learning contents related to nature and society studies" is accepted.

Conclusion

The general conclusion of research is: adequate use of innovative models of teaching of nature and society that are based on cooperative learning, learning through joint problem solving, learning through discovery, research directed learning, differentiated requirements for students, multiple communication in the classroom and direct contact with sources of knowledge (natural materials, educational software, internet, ...) leads to a significant increase in student achievement and thus contributes to enhancing the effectiveness of teaching nature and society studies. The quality of students' knowledge is improving, because learning, understanding and application are emphasized, and students gain skills they need for further study of educational content from the area of nature and society studies.

Traditional models of learning in the teaching of nature and society studies operate only in the field of reproductive learning of facts and recognition of concepts and phenomena, and are poor triggers of students' thinking processes. Although teachers know the benefits and basic organizations of those forms of learning were the foundation of innovative models of teaching nature and society included in this study, some resistance to their use in teaching is still present. So here an attempt is made to eliminate the many ambiguities by directing teachers to manners of implementing the selected models. Continuous professional development of teachers for the implementation of innovative ways of learning in teaching nature and society studies are a condition of a wider application of the proposed and similar models of work.

References

Dryden, G., Vos, J.(2004): *Revolucija i iscenju: kako promeniti начин на који свет учи*, Timgraf, Beograd.

Де Зан, И. (1977): *Занимљивости природе*, Profil international, Загреб.

Костовић, С. (2006): *Наставник и управљање микропедагошким процесима*, у: Реформа система васпитања и образовања у Републици Србији, ур. Емил Каменов, Филозофски факултет: Тампограф, Нови Сад.

Костовић, С. (2006): *Компетенције наставника као димензија професионалног развоја наставника – претпоставка педагошког менаџмента*, Зборник радова са међународног интердисциплинарног научног скупа „Европске димензије реформе система образовања и васпитања“, Одсек за педагогију и филозофског факултета у Новом Саду, 314-319.

Милутиновић, Ј. (2006): *Транзиција ка друштву знања и филозофија доживотног учења*, Зборник радова са међународног интердисциплинарног научног скупа „европске димензије реформе система образовања и васпитања“, Одсек за педагогију и филозофског факултета у Новом Саду, 156-161.

Сиденко, А. С. (2006): *О иновационим и традиционалним моделима наставног процеса*, Настава и васпитање, бр. 2, Друштво педагога Србије, Београд.

Stavrev Veselinovska S. (2008), *Zapoznavawe na okolinata za III oddelenie za devetgodisno osnovno obrzovanie*, Prosvetno delo, Skopje, R. Macedonia.