

APPLICATION OF PROBLEM SITUATIONS IN AN INTEGRATED LESSON "CIRCLE OF MATERIALS" IN THE SCHOOL SUBJECTS „HOME AND EQUIPMENT" AND "MAN AND NATURE" IN 4TH CLASS OF PRIMARY SCHOOL (P 4 OR K-4)

MILENA TSANKOVA¹, NELI DIMITROVA²

ASSOCIATE PROFESSOR PHD AT KONSTANTIN PRESLEVSKY – UNIVERSITY OF SHUMEN
PEDAGOGICAL FACULTY, COLLEGE DOBRICH,
DEPARTMENT "CROP PRODUCTION AND PLANT PROTECTION"¹

ASSOCIATE PROFESSOR PHD AT KONSTANTIN PRESLEVSKY – UNIVERSITY OF SHUMEN
PEDAGOGICAL FACULTY,
DEPARTMENT TECHNOLOGY STUDY AND VOCATIONAL EDUCATION²

BULGARIA

MILENA_B@ABV.BG¹
DIMITROVA.NELLY@GMAIL.COM²

ABSTRACT: IN THIS ARTICLE IS PRESENTED APPLICATION OF PROBLEM SITUATIONS IN AN INTEGRATED LESSON "CIRCLE OF MATERIALS" IN THE SCHOOL SUBJECTS „HOME AND EQUIPMENT" AND "MAN AND NATURE" IN 4TH CLASS OF PRIMARY SCHOOL (P 4 OR K-4). THE PURPOSE OF ARTICLE IS TO PRESENT THE APPLICATION OF PROBLEM SITUATIONS IN INTEGRATED LESSONS ON SUBJECTS OF CULTURAL AND EDUCATIONAL FIELDS "BIT AND TECHNOLOGY" AND "SCIENCE AND ECOLOGY".

THE HYPOTHESIS THAT IS PROVED THROUGH RESEARCH IS THAT IF IN TEACHING THE SUBJECTS OF CULTURAL AND EDUCATIONAL FIELDS "LIVE STYLE AND TECHNOLOGY" AND "SCIENCE AND ECOLOGY" APPLY PROBLEMATIC SITUATIONS IN INTEGRATED CLASSES, THE EXPECTED RESULTS WILL ENHANCE COGNITIVE PERFORMANCE AND STUDENT ACHIEVEMENT, THE DURABILITY OF THE ACQUIRED KNOWLEDGE AND SKILLS.

KEY WORDS: PROBLEM SITUATIONS, EDUCATION, INTEGRATED LESSON

INTRODUCTION

MODERN living requirements necessitate a change in the education system. It must prepare quickly adaptable and creative minded individuals. This requires updating process of training and education using new methods and techniques. Suitable for this purpose are problematic situations application in integrated lessons. Since "The problem is this kind of training courses in which intensified mental activity of students by placing them in a situation to look, decide and discover information, facts, events, conditions, etc., which summarized them in logical inferences" [4].

BASED on this presented an empirical research whose *purpose* is to present the application of problem situations in integrated lessons on subjects of cultural and educational fields "Bit and technology" and "Science and Ecology"

The hypothesis of the study is that if in teaching the subjects of cultural and educational fields "Bit and technology" and "Science and Ecology" apply problematic situations in

integrated classes, the expected results will enhance cognitive performance and student achievement, the durability of the acquired knowledge and skills.

Object of this study are problematic situations in an integrated lesson in Home and equipment - on "Circle of materials" for the 4th class of generalized topic: Working with materials.

The subject of the study is the educational content in "Home and equipment" for application problem situations in integrated lessons.

RESEARCH PROBLEM

TRAINING problem is discussed in the works of several authors as M. Mahmutova, Y. Babanski, I. Lerner ... etc. The main task of problem developing training is "complete formation of man - the harmonious development of personality and socialization of personality" [5, p. 7]. Aims not only to acquire scientific knowledge, but also the development of intellectual, motivational, emotional and other areas of learners, capability development, general development of the personality of the learner. In problematic training process of interaction of the teacher and students is directed to the individuality of the student and his socialization. One of the key concepts in problem training is "problematic situation".

THE term *problematic situation* means an intellectual disability, which is artificially created by the teacher or spontaneously arisen in the learning process and overcome this difficulty requires creative search of new knowledge, techniques and actions [4]. Problem situation can be defined as a *model of productive creative cognition*. This activity is fully active intellectual and manifests itself in the process of formulating and solving a problem. For example, M. N. Skatkin states that "the problem situation is realized by the subject difficult ways to overcome which are unknown to the subject - they must be sought" [11].

IN pedagogical practice exist a number of the researches on the use of problematic situations in the learning process. These studies show that the problems situations positively influence increasing cognitive activity of students, and formulating their creative thinking.

THE structure of the problem situation includes the following elements (Figure 1):

1. Cognitive need to incite the student activity
2. Unknown knowledge
3. Intellectual abilities of the individual.

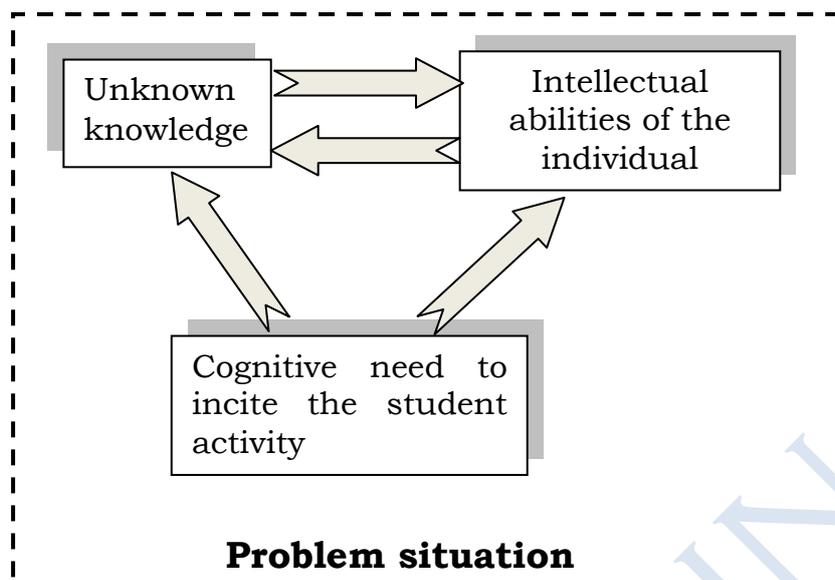


Figure 1. *Elements of problematic situations*

IN problem situations, students are placed in a practical situation of difficulty, a problem which must be resolved. It is a good means for activating students. N. Chakarov stated that "indicator thinking highest is learning that puts students with problems and raises his creative thinking" [2, p. 121].

APPLICATION of integrative links between subjects contributes to faster and more easily achieve the expected results provided in the curriculum. Consider integrative links [12] between the subjects of cultural and educational fields "Bit and technology" and "Science and Ecology" applied in specific methodological developments. Models of such lessons are offered in the Department. In them is selected structure in a logical sequence to present the problem of integration from a theoretical perspective and the application 'in specific methodological decisions.

PRESENTED are technologies for use in stressful situations integrative lessons, which contributes to the higher results. New possibilities for the application of problem situations in integrated lessons between subjects of cultural and educational fields "Life and art" and "science and ecology."

UPON presentation of the objectives included and integrated objectives. That lesson: To form the knowledge that the destruction of wildlife and pollution of the natural environment imbalances in nature and adversely affect human health; to learn about recycling as a concept; to develop skills for separate collection. Expected results refer to two school subjects: home life and equipment and man and nature:

- Recognize different materials and raw materials, including plastics and indicate their specific use in everyday life. Named materials with high durability and materials that can be recycled. Indicate possibilities for reusing paper, metals and plastics. Process different materials, including plastics, like cut, bent, drilled, glued.
- In "Man and Nature": To recognize harmful to humans and nature activities. To recognize substances and wastes that pollutes the environment. To understand the harmful effects of pollutants on humans.

ATTENTION is drawn to promising integrative relations training to the next level - in secondary school in the summary entitled "Technology and Production" which discusses the use of different types of material in households and industry.

IN the course of the lesson in creating a positive emotional and cognitive attitude through problem situations and case studies highlight the need to protect the environment clean; maintaining the balance of nature. Based on the issues raised concludes that without conservation of human life and other living organisms is unthinkable. When checking the knowledge obtained so far provide examples and situations for the role of humans in nature. The conclusion is that all people should be save nature, and students must be environmentalists.

SPECIFIC problematic situation is used in an integrated lesson in Home and equipment and man and nature in 4th class entitled "Circle of materials" [12, 75]. Lesson structure differs with the combination of knowledge of the two school subjects to absorb these concepts with integrated nature: recycling, pollution, environmental protection, waste, scrap, waste collection. All these concepts are summarized in the following problem situation:

DURING the independent work of students to put the question "*Helpful or harmful plastics are for man and nature.*" So put the problematic situation provokes analytical and synthetic mental activity of students. To answer highlights the negative impact of man on nature, caused by *pollution of the environment* with plastics that are practically irreducible materials. In the lesson students discuss the issue of environmental protection. Discussed measures to be taken as *separate collection garbage* by household and industrial activity of man to not pollute the environment with this type of material and *recycled*.

METHODS

To achieve the objective of the present study used the following methods:

- Theoretical method - study and analysis of the literature. Used to identify any developed theoretical problem in the application of the problematic situation in other educational areas and to determine on what theoretical basis will build educational technology for the application of problem situations in the content of "Home and equipment" and "Man and Nature" in 4th class. The analysis of the literature provides a theoretical basis for solving the problem underlying the purpose and hypothesis of the study.
- Method modelling - used in developing problem situations, listed in the curriculum of integrated lesson in Home and equipment and man and nature in 4th class on "Circle of materials".
- Sociology pedagogical method - analysis of students' work during school hours and analysis of the results of tests to establish a student of the pedagogical experiment.
- Statistical methods - processing the data obtained from the tests.

RESULTS AND DISCUSSION

RESULTS of pedagogical research on the use of problematic situations in the content of "Home and equipment" and "Man and Nature" in 4th class on are subjected to statistical analysis. To establish the level of a student has a test after the completion of the integrated lesson "Circle of materials". Test is treated by the methods of:

- Measurement of basic statistical parameters: arithmetic average (\bar{x}) and a mean (standard) deviation (σ) - The aggregates used to describe the empirical distribution of the entire population. They are generalized characteristics and play a decisive role in comparative analyzes based on different conclusions about the state of the population [10].
- Verification of statistical hypotheses by comparing the averages. Used t-test of Student.

TABLE 1 shows the mean values and measures of dispersion of the surveyed students of 4th class for the application of problem situations in the curriculum of integrated lesson "Circle of materials", as well as statistical data to verify the hypothesis.

Table 1. Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 CG	8,82	22	1,82	Pair 1
EG	9,73	22	,70	

FROM Table 1. it is seen that EG is higher average value ($\bar{x} = 9,73$) relative CG ($\bar{x} = 8,73$) indicating that the test results are higher. This gives us every reason to claim that the application problematic situations are properly selected and subtle, because success in the experimental group was greater.

ANOTHER important indicator to prove the correctness and accuracy of the application of problem situations in the content is a mean (standard) deviation (σ). Data for the mean square deviation, reflected in the same table show what dissipation in the group, i.e. what are the differences between the tested students in a group.

WITH less distortion (less value of the mean square deviation) ($\sigma = 0,70$) are students of EV, compared to students from CG ($\sigma = 1,82$) They have small differences between individual members of the group, which means that they are more concentrated around centre, which is set to a student.

Table 2. Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	CG & EG	22	,034	Pair 1

THE value of the correlation coefficient in Table 2 (0.34) shows that the relationship between the two groups was *moderate*.

Table 3. Paired Samples Test

	Paired Differences				t	df	Sig. (2-tailed)	
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower				Upper
Pair 1	-,9091	1,92500	,41041	-1,7626	-,0556	-2,215	21	,038

FOR the comparison of averages is used **t-test of Student**. Proving the correctness of the assumptions associated with established difference between the two averages (for EG and CG). It should be borne in mind that the confidence level of standard in the specified critical level of significance $\alpha = 0,05$ the critical value is also standard t-test theoretical = 2,09 [6]. The value obtained for t (empirically) is compared with the value of $t\alpha$ (critical).

EMPIRICALLY determined value t-test empirical = 2,215 is higher than theoretical value (Table 3), indicating that the difference of the average values of the two groups - EG and CG was statistically significant.

THIS supports the importance of experimental work and confirms the hypothesis that the use of problematic situations in an integrated lesson "Home and equipment" and "Man and Nature" in 4th class increase the success rate of students and their cognitive performance at a high level.

THIS supports the importance of experimental work and confirms the hypothesis that the use of problematic situations in an integrated lesson "Home and equipment" and "Man and Nature" in 4th class increase the success rate of students and their cognitive performance at a high level.

CONCLUSION

THE example shows the need to effectively combine methods and approaches to learning. Training material has the potential to carry out training problem. Students should have mastered heuristics for the educational content.

THE research revealed interesting results with theoretical and practical. It confirmed the need of intensification and technology provision by the application of an interdisciplinary approach to methodological training for subjects of cultural and educational fields "Life style and technology" and "Science and ecology." Technologies are utilized to implement the educational process "served" by problematic issues and situations, regardless of the specific features of the diverse and complex structure of educational content. So be implemented in a particular way of thinking and acting. After using these technologies enhance the quality of training of students - future teachers and their competences to carry out professional activities at school.

REFERENCES

1. **Artemyev, G.V, 1973:** Artemyev, G.V, Problem learning in the course of social science, Moscow, 1973
2. **Chakarov, N.,1980:** Чакърлов, Н., Педагогическо взаимодействие. С., Народна просвета, 1980
3. **Davydov V.V, 1986:** Davydov V.V, Problems of developmental teaching, Moscow, 1986.
4. **Dimitrova, N., 2012:** Dimitrova, N., Characterization of problem-based learning as an interactive educational technology. Proceedings - Innovation and interactive technologies in education. Sofia, 2012, pp. 199-203.
5. **Grebnyuk, O., 1996:** Grebnyuk, O., Obshtaya pedagogika. KGU. Kaliningrad. 1996.

6. **Ivanov, I., 1998:** Ivanov, I. Statistical data processing of Educational Research, Shoumen, 1998.
7. **Lerner, J.J., 1968:** Lerner, J.J., Cognition problems in teaching history, Moscow, 1968.
8. **Lerner, J.J., 1974:** Lerner, J.J., Problem-solving training, Moscow, 1974
9. **Mahmutov M.I., 1975:** Mahmutov M.I., Problem learning. The main problems of the theory. MM: Pedagogy, 1975.
10. **Radilov, D., 1995:** Radilov, D., et al. Introduction to statistics, Varna, 1995
11. **Skatkii, M.N., 1971:** Skatkii, M.N., Improving the learning process, Moscow, 1971.
12. **Tsankova, M., Dimitrova, N., 2009:** Цанкова, М., Димитрова, Н., Интеграция при подготовка на бъдещи учители (Методическо ръководство), Шумен, Изд. „Фабер”, 2009

SOCIOBRAINS