

Primary School Pupils' Problem-Solving Skills Formation

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Abstract: The article substantiates the forms and methods of Ukrainian primary school pupils' problem-solving skills formation. The effects caused by the lack or absence of such skills in children are shown. Purpose of the article: to substantiate the forms and methods of primary school pupils' preparation for solving life problems.

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The following problems that occur with primary school pupils are classified: cognitive, procedural, related to communication, emotional states, problems of recognition, security. On the basis of tests, questionnaires and conversations with schoolchildren, the difficult situations which frequently happen in children's lives are revealed. The mistakes which pupils have made during testing are identified. The lessons which might help to solve the problems are displayed. Case studies, in relation to interactive technology methods, have been analysed as the effective way to solve pupils' problems. Examples of case situations are given. Diagnostic tools for measuring pupils' awareness of problem-solving skills are identified. Indicators of awareness levels (high, sufficient, initial) are determined. The effectiveness of the proposed forms and methods of work has been proved experimentally. The emphasis is placed on the need to improve the training of future educators in the direction of pupils' problem-solving skills formation.

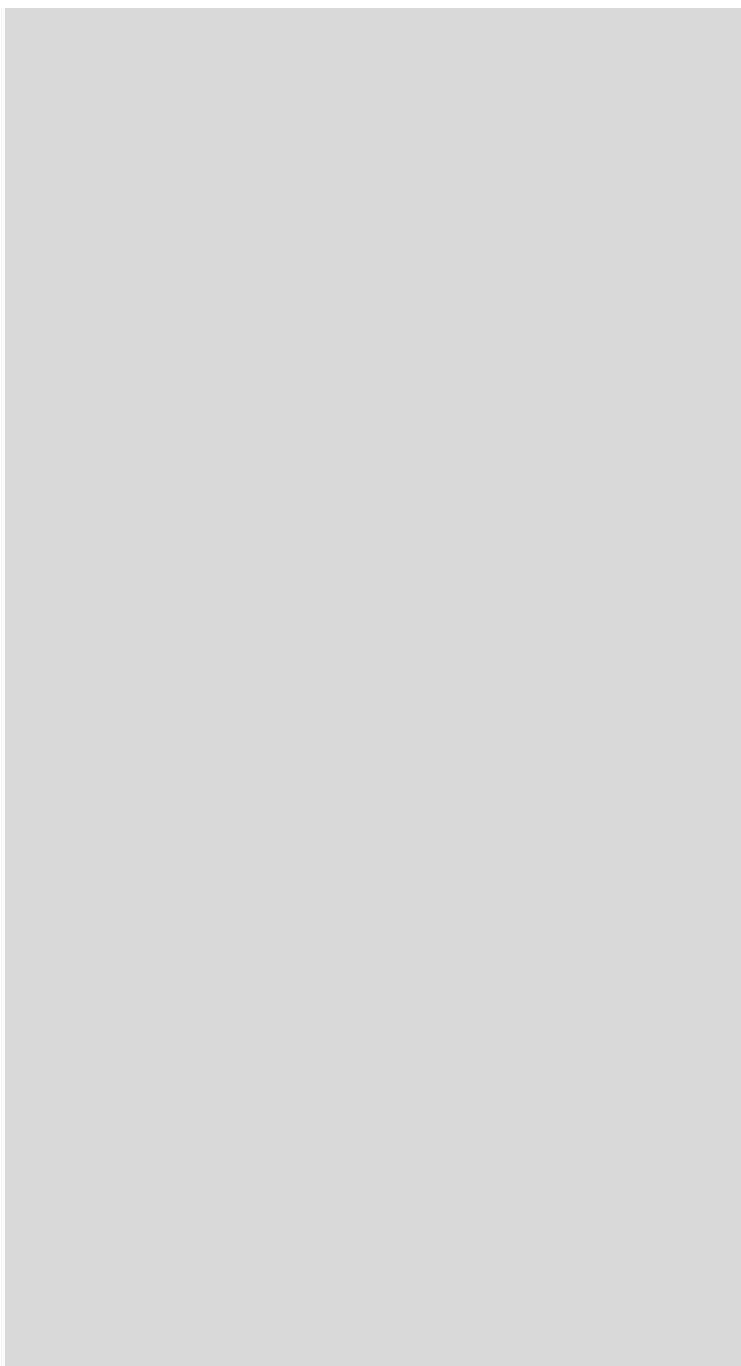
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1. Introduction

As a rule, scholars reveal the results of the problematic training organization. However, it is not sufficient for a student to learn the basic school subjects in order to develop the ability to solve vital problems. Some important for the student problems often remain outside the educational process, namely: what to do, how to act if you or another child are being offended; if you feel insecure, if you have been overcome by doubt and anxiety; if you do not feel needed, significant; if you do not find understanding with friends or parents, if you cannot suppress the desire to play computer games, or socialize on the Internet, etc. One of the urgent primary school tasks is the comprehensive development of a child, his or her talents, abilities, competences and cross-cutting skills. The changes in the content, forms and methods of the educational process occur in this direction. The significant innovation of a modern primary school in Ukraine is the formation of pupils' problem-solving skills. Primary education standards (not only in Ukraine but also in EU countries) identify other cross-cutting skills that primary school pupils need to master: reading comprehension, being able to express their opinions verbally and in writing, critical and systemic thinking, creativity, initiative, ability to justify position logically, manage emotions constructively, assess risks, make decisions, cooperate with others (Government of Ukraine, 2018). The analysis of these skills makes it possible to conclude that they are interconnected. After all, it is impossible to solve problems without having critical thinking or the ability to manage emotional states. At the same time, primary school teachers and, after all, a number of scholars are convinced that a primary school pupil cannot solve life problems without parents, teachers and authoritative adults. Pupil's ability to solve problems in primary school is limited with solving problematic situations when studying school subjects.

In order to refute or confirm the opinion according to the primary school pupil's ability to solve life problems, we conducted our own research and organized the experiment in primary schools of several Ukrainian regions.

In order to construct a working hypothesis (whether a primary school pupil is able to solve problems; what problems he or she can solve), we turned primarily to scientific sources.

2. Literature review

Studying researches and publications has shown that scientists usually limit the ability of children to solve problems within the framework of academic subjects, that is, cover the organization of problematic learning, creating problem situations in the classroom.

Problem-based learning in pre-school and primary education has been the subject of many scholars' investigations. We studied problem-based learning not only for primary school children, but also for preschool children, considering the implementation of the principle of continuity in the educational process.

Gürbüz and collaborators (2017) research is valuable for our scientific investigations. Its authors highlight the experience of using computer games to develop algorithmic thinking and problem-solving skills for primary school pupils (Gürbüz et al., 2017); interesting for our research is the study of scientists S. Ciftci, and A. Bildiren (2019), which shows the impact of coding courses on cognitive and problem-solving skills of preschool children. In the research of L. L. Diamond and Y.-J. Hsiao (2019) the experience of using situation cards to develop decision-making skills is analysed; relevant are comparative studies by T. K. Ngang, S. Nair, and B. Prachak (2014) in which tools have been developed to measure thinking and problem-solving skills among primary school pupils in different regions of Malaysia (Nair & Ngang, 2010).

Studying the works of scientists has shown that the scientific investigations do not fully reflect the problem under study, and no concrete ways for primary school pupils' problem-solving skills formation are offered.

Scientists highlight the value of the case study method in primary school and in other types of institutions, but as a method of mastering the content of school subjects or disciplines in higher education. In particular, researchers E. Alvi and R. M. Gillies (2020) study the use of a case study to promote self-regulated primary education. The problem of promoting the development of creative thinking of younger students in mathematics lessons a dedicated study by E.M. Schoevers and collaborators (2019).

However, we have not identified any attempt to use the case study in connection with interactive methods as an effective way of developing a cross-cutting skill for primary school pupils to solve problems.

Swiss teacher Johann Heinrich Pestalozzi (1981) was one of the first in the history of pedagogical theory and practice who tried to prepare pupils for the solution of life problems. Then and now, the overriding issue was to

overcome the poverty. J. H. Pestalozzi (1981) believed that it was necessary to create a special textbook in which to lay out the basics of household, agriculture and industrial production, as well as to explain what opportunities are open to the poor when to participate in these three areas of work. The same book should explain the poor all the benefits of poverty: the ability to concentrate strength, thrift, more developed skills and the ability to cope with the desires of the rich, who have the advantages of money and wealth. Money makes it easier for the rich to start any business, but in the future, the rich fall behind those who were in poverty, prepared for the same business and made it to the top later (Pestalotsti, 1981).

The ability of primary school pupils to solve problems as a cross-cutting skill is currently reflected in individual studies. Scientists I. Konovalchuk (2017), T. Lowrie (2002), R. Lesh (2013) usually cover the results of problem-based learning organization.

The idea to solve problems in several ways, the need to evaluate the strengths and weaknesses of alternative solutions are valuable for our research: When the children are aware of several different ways of thinking about a given problem, are they themselves able to assess the strengths and weaknesses of these alternatives — without asking their teacher or some other authority? When these two criteria are satisfied, children are able to go from 'first-draft of thinking' to 'Nth-draft of thinking' without interventions from an outside authority (Lesh, 2013).

The issue of creative problem solving and creative thinking in primary school is reflected by a Polish researcher M. Just (2017). She argues for the need to bring innovation, which is to solve problems creatively, to the needs of the labour market. This is one of the most required skills of 2020, according to a report *The Future of Jobs*, created during the World Economic Forum in Davos in 2016. Other useful skills include critical thinking, creativity, people management, etc. The author has covered the experience of implementing the innovative educational program 'Creativity Lessons — Creating Problem Solving in Practice' at Wroclaw schools (Poland). She noted: "Teaching the youngest pupils creative problem solving in practice is first of all stimulating cognitive curiosity of children and developing skills of formulating right and interesting questions; it is gymnastics of thought, improvement of thinking flexibility and originality" (Just, 2017). However, the author focuses on solving problematic situations in learning, rightly believing that solving learning problems contributes to solving those that are not the subject of study at school. However, *it is not enough for pupils to learn basic school subjects to develop the ability to solve life's problems.*

This is stated in the PISA study published on PISA Ukraine (“Teachers can develop pupils’...”, 2019).

At the same time, research analysis shows that problems beyond the school subjects remain underestimated in the educational process: what to do, how to act if you or someone else is offended; if you feel insecure, if you feel doubt and anxiety; if you don’t feel yourself necessary, meaningful; if you don’t find agreement with your friends or parents, if you want to play computer games all the time, or socialize on the Internet, etc. There are many following problems in the life of a primary school pupil. But we have not found any works which discuss the preparation of primary school pupils for their solution.

Purpose of the article: to substantiate the forms and methods of primary school pupils’ preparation for solving life problems.

3. Method

Quantitative and qualitative methods of scientific research were chosen for the realization of the goal.

Quantitative: questionnaire, poll, testing, pedagogical experiment to identify the levels of primary school pupils’ awareness with the ways to solve life problems.

The experimental base of the study: third and fourth forms of schools in Ternopil, Lviv and Khmelnytskyi regions, Ukraine. Urban and rural schools of three Ukrainian regions were selected to ensure the accuracy of the results of scientific research. The study was conducted during 2019 among the third form pupils (and from September 2019 — the fourth form pupils) in primary school. The content of the school program for the third form is focused on developing pupils’ problem-solving skills.

We developed two types of questionnaires for pupils. The first one was to identify the problems of primary school pupils. The second one was to diagnose the levels of primary school pupils’ awareness with the ways to solve life problems.

The study involved 203 pupils and 8 teachers.

It should be noted that scientific exploration was conducted in agreement with the school administration. Parents whose children participated in the study were informed of their children's participation in the study and gave their agreement.

We have chosen the case study method in unity with interactive methods, as a way to increase the level of problem-solving skills formation, as well as a project method, the result of which is to create an e-book, a kind

of textbook about life, that allows pupils to learn about peers' problems, and how they solve them.

The feasibility of choosing this method has been proven by numerous studies. In particular, we focused on the following arguments:

'The case study teaching method is a highly adaptable style of teaching that involves problem-based learning and promotes the development of analytical skills (8). By presenting content in the format of a narrative accompanied by questions and activities that promote group discussion and solving of complex problems, case studies facilitate development of the higher levels of Bloom's taxonomy of cognitive learning; moving beyond recall of knowledge to analysis, evaluation, and application (1, 9). Similarly, case studies facilitate interdisciplinary learning and can be used to highlight connections between specific academic topics and real-world societal issues and applications (3, 9). This has been reported to increase student motivation to participate in class activities, which promotes learning and increases performance on assessments.' Kevin M. Bonney

The final diagnostics of formation levels of the problem-solving skill's cognitive component indicators was conducted in January 2020.

The study also involved part-time students of Ternopil Volodymyr Hnatyuk National Pedagogical University and Khmelnytskyi Humanitarian-Pedagogical Academy, who are working as primary school teachers, to find out how prepared they are to teach pupils to solve problems and whether they form such skills.

The experimental base of the study: third and fourth forms of schools in Ternopil, Lviv and Khmelnytskyi regions, Ukraine; part-time students of Ternopil Volodymyr Hnatyuk National Pedagogical University and Khmelnytskyi Humanitarian-Pedagogical Academy.

Qualitative: analysis of scientific sources, interviews with primary school teachers, observation of pupils in the third and fourth year of primary school education in Ukraine. Interviews with teachers, conversations with pupils in experimental schools allowed us to conclude that we can learn how to solve problems only by solving them. While the theoretical material in primary school textbooks is interesting, it is only remembered when it touches the pupil's life.

4. Results

4.1. Problems that arise in primary school pupils' life.

The need of primary school pupils' problem-solving skills formation is explained in the normative documents for primary school development by

the fact that these skills are in demand in the labour market, they make it possible to become successful in life. However, there are also other factors to be emphasized: the lack of this ability leads to sad consequences, including tragic ones. Unfortunately, the number of primary school children who have committed suicide is increasing in the world. Suicide cases of six-year-old children are known. Unfortunately, there are younger children who are convinced that they can also solve their problems in this way, causing parents or others to feel sorry for the wrongful acts or words against them. At first glance, this seems doubtful. It is more likely that a primary school pupil may not yet be aware of suicide cases. In fact, this is not true.

The features of understanding the death by children aged 5 – 7 years and from what sources they learn about suicide are found out: ‘Children’s understanding of death (Mishara, 2003, p. 129) argues that for children to understand suicide they must first understand death. He suggests that preschool children first conceive of death as reversible, as not universal or inevitable. This may be based upon portrayals of death in fairy tales, where characters can be reawakened or brought back to life with magic powers, for example. Children do not retain this immature understanding of death for long and by the age of 6 – 7 years, two thirds of children understand that everyone dies and most know that we must all die one day. Children are also exposed to death by suicide. Research from Quebec in 1999 found that half of the children aged 5 – 7 years reported seeing at least one suicide on television and older children could report on at least one such incident and usually several deaths by suicide in television programs’.

The statistics on child suicide in Australia are impressive: ‘The Australian Bureau of Statistics (ABS) (2016) reported: — Not being aware of any recorded suicide deaths of children under the age of five years. — In 2016 suicide was the leading cause of death of children between 5 and 17 years of age.

In the period 2010 – 2014, the ABS reported: — 88 deaths (43 males, 45 females) by suicide of children aged 5 – 14 years old. — 305 suicides of children aged 5 – 17 years’ (“Understanding suicide...”, 2018).

The causes of child suicide seem trivial to us and are astonishing: an unfair mark, not received gift, a quarrel with parents because of room cleaning, etc.

However, suicide is the extremely negative consequence of not being able to solve problems. There are other less painful consequences:

- after the first failure, or several attempts, the child will stop moving forward;
- the child will not be able to identify and reach the goal;

- it is difficult for the child to establish relationships with others, and conflicts will arise more and more frequently;
- the child will not be able to analyse the problem and predict what to do next;
- in the long run, he or she simply cannot fully exist in today's society and find a decent job.

Therefore, it is time to develop the ability of children to solve problems not only during language, literature, mathematics, science lessons, etc., but also to overcome life's difficulties, which are not often described in school textbooks. However, the development of capacity to solve them is foreseen by typical educational programs for primary school pupils. Their analysis and our empirical research have highlighted the need for a special classification of pupils' problems, which facilitates a comprehensive analysis and search for ways to overcome, identify forms and methods of preparing pupils to solve them.

The leading criteria on the basis of which we have categorized children's problems are: the structure of child's 'I-concept' (it considers the main components: 'I know'; 'I can'; 'I like'; 'I am in demand'; 'I am protected'), the social nature of a person, which implies polysubjective communication (Yankovych, Bednarek, & Anldzheievska, 2015). Based on these criteria, the following groups of children's problems were identified:

- 1) cognitive (subject — related to school subjects, extracurricular — not reflected in programs and textbooks);
- 2) procedural (lack or absence of ability to perform certain activities);
- 3) communication problems (misunderstanding with peers, seniors, classmates due to personal qualities such as reticence, seclusion and inability to prevent or overcome conflict situations);
- 4) recognition problems related to satisfying the instinct of self-importance;
- 5) problems related to emotional states (negative: fear, anxiety, sadness, anger, etc.; lack of positive emotions: love, sympathy).
- 6) security problems.

Although this division is relative, it allows comprehensive consideration of difficult life situations that may occur with a child.

We conducted a survey among pupils of third form in urban and rural schools of Ternopil region to find out what particular problems children face.

52 pupils (28 boys, 24 girls) of the Ternopil school № 16 were interviewed. Firstly pupils described their problems, later — problems with friends or acquaintances. All pupils noted that they had to face difficulties.

Among the problems is the lack of free time for favourite activities. 34 (65.4%) pupils wrote about it. 10 (19.2%) pupils had learning difficulties. The same amount was in communication. 12 (23.1%) pupils were offended. Only two pupils had 3 problems at once: he was insulted and offended by elders, there were difficulties in dealing with them, he could not overcome anxiety. At the same time, parents and friends were helping him to overcome his problems.

30 (57.7%) children, describing the problems of others, wrote that their friends and acquaintances were offended by either peers or seniors. Only 14 (26.9%) pupils wrote about learning difficulties as the unresolved problem. Only 6 (11.5%) pupils wrote about friends who could not overcome anxiety.

Thus, when it comes to their own problems, it is mostly a lack of free time, only occasionally offense and problems in learning and communication. When it comes to the problems of other children, they are mostly offended.

Thus, cognitive and security problems prevail.

A comparative analysis of the difficulties experienced by rural school pupils (48 pupils) shows that there is no significant difference between urban and rural pupils' problems. First of all, all the pupils indicated that they had problems. 22 (45.8%) pupils did not have enough free time for favourite activities. 11 (22.9%) pupils had difficulty communicating with seniors. Only 6 indicated that they had learning difficulties.

Children wrote the following about their friends and acquaintances: 15 (31.3%) pupils had difficulty communicating with peers; 11 (22.9%) pupils did not find understanding in the class (only boys wrote about it); 13 (22.1%) pupils had difficulties in learning (this was mostly written by girls); 16 (33.3%) pupils had difficulty communicating with seniors. Only four children (16.6% two boys and two girls) stated that their friends and acquaintances were offended. Thus, if urban schoolchildren say that their friends' dominant problem is their offense, rural children have problems mainly with communication and understanding. Mostly girls concentrate on learning problems. Understanding in the classroom and communication with seniors are mainly boys' problems.

Conversations with pupils made it possible to conclude that they were not sufficiently aware of the ways to solve problems.

Empirical studies, sources' analysis have shown that effective teaching methods for primary school pupils are interactive (pupils' activity is higher than the teacher's), which are undoubtedly appropriate for implementation in our study; in addition, we consider that case-study

method plays a key role. It is the consideration of specific situations that children face in life that enables them to raise their awareness of ways to overcome life difficulties.

4.2. Case study as the effective method of teaching primary school pupils to overcome problems

Analysis of school programs for primary school pupils shows that pupils' ability to solve problems should be formed from the first form (Savchenko, 2019). Among the learning outcomes that help to prevent and solve problems in the first and second forms are the following: *complies* with the communication rules, *distinguishes actions*, gives them judgment in terms of morality, *expresses* judgments about actions, events, phenomena, *does not violate the rights* of other children, identifies and condemns the acts that offend or humiliate others, *differentiates* how and who to ask for help; plans his or her day (school and day off) (Savchenko, 2019a). And in the third and fourth forms, a pupil offers a solution to the feasible problems of the school, the community, resolves conflicts peacefully; gives examples of responsibility for committed offenses; learns about environmental problems from people, media and other sources, analyses this information, discusses ways to solve them (Savchenko, 2019b). All these and a number of other important actions are listed among the pupils' learning outcomes in a typical educational program. It is proposed not only for the pupil to identify problems of their own lives, but also to be able to reflect them in media products. Primary school graduates need to be able to set goals, solve tasks step by step, manage their emotions and analyse the results of their activities.

Empirical scientific exploration and source analysis show that the most popular form of learning pupils to overcome problems is a lesson with the usage of problem-based learning. By developing children's creative and critical thinking, pupils develop the ability to comprehend life problems and find out the ways to solve them.

For example, during the lessons in the subjects 'I am exploring the world (Ya doslidzhuui svit)' (1st form), 'Fundamentals of health (Osnovy zdorovia)' (2nd – 4th forms), 'I am in the world (Ya u sviti)' (3rd – 4th forms) (these subjects will be removed in the next year in accordance with new programs; the issues studied in them will be addressed in new integrated courses) in primary school, pupils learn about their rights, what cannot be violated, responsibility for actions, including for aggressive actions. The textbook for pupils of third form 'I am in the world' states: 'It is the duty of everyone not only to know their rights and enjoy them, but also to obey the rules and laws of society honestly so as not to violate the rights of others'

(Bibik, 2014). Pupils learn: ‘No one has the right to offend a person. (You cannot treat him or her cruelly)’ (Bibik, 2014, p. 132). Pupils also learn that some of their actions, which they considered to be harmless pranks, are in fact offenses punishable at the legislative level.

The textbook ‘Fundamentals of health’ for the 4th form discusses the topics on safe and dangerous situations, indicates emergency contact numbers (rescue service, police, ambulance, gas service) (Hnatiuk, 2015). Teachers tell pupils about the work of trust and social services, give their contacts.

During the lessons, pupils learn how to organize their study to achieve a certain result (Hnatiuk, 2015). And what should be done if there are quarrels, fights, insults, mockery of a weaker in the class (Hnatiuk, 2015). Pupils are asked to analyse the situations that often occur in the classroom and which solution is the ability to say ‘no’ (Hnatiuk, 2015).

However, there are problems that are not considered when studying subjects (loneliness in class, in family, acute need for love, etc.).

Having analysed the methods of the educational process in primary schools, we have suggested that case study can be the most effective way to prepare pupils for problem solving. The main advantage of this method is the consideration of real-life situations that are really interesting for children. Pupils are aware that similar events can occur in their lives. Case study involves comprehensive analysis of information, finding alternative ways to solve a problem and choosing the best solution. It is successfully combined with interactive methods (‘Role playing’ or dramatization, working in groups, PRES method, ‘Take a position’, ‘Aquarium’, etc.) which is shown in the figure. The result of pupils’ work in partnership with parents and teachers is the creation of e-book, which describes situations that often happen to pupils and how they can be solved (*Figure 1*).

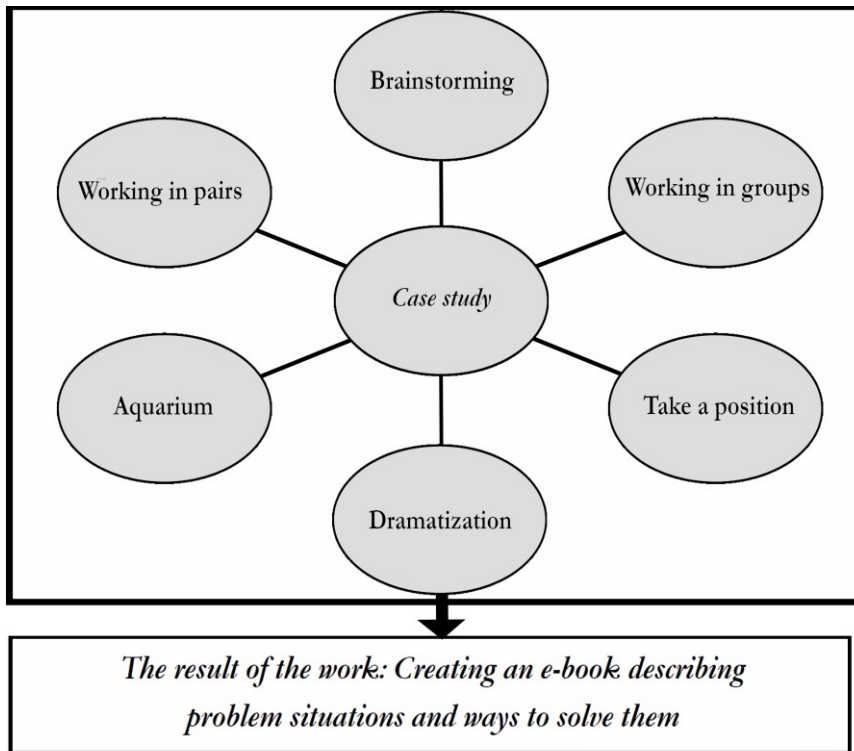


Figure 1. Methods of preparing primary school pupils to solve problems as a cross-cutting skill in primary schools

Of course, it is possible to tell children what conflict resolution strategies are, how to effectively organize learning activities or any other activity (work, sports, etc.). But the knowledge acquired will quickly be forgotten if it is not used to analyse situations that pupils find difficult.

Thus, case study is a method of creating motivation and gaining knowledge.

After having conversations with children, we have come to the conclusion that situations for children are relevant, which can be placed in the experimental case, as examples for children to fill with:

‘Milena didn’t have time to look around when the evening came. And she still did not begin to do homework. A friend Yustynka visited her for a minute... They tangled for a while. So what? It was necessary to have a rest after school. Dad’s laptop was on the table. It was not bad to take this opportunity to watch something interesting and to play. And then her mum came and took Milena to a dance studio. And after dancing, you have to learn. And when to draw? Milena loves to draw. She wanted to give her

grandmother a birthday picture. Grandmother loves Milena's drawings. And there is no time at all... And where to get it?

'Denys is offended by classmates. Arsen pinched him, then Serhii pushed him during a break. And Tymur even hit him with a book. Darynka noticed all this. But how to help a friend?'

'Zakhar knows that his parents are going to work. Far away in Poland. And he will live with his grandparents. He wakes up with anxiety in his heart more frequently. How will he be without his mum and dad? Anxiety, fear... He doesn't even want to study. But he does not know how to overcome anxiety.'

'Slavchyk is convinced that his classmates don't like him. He is silent, shy. And children like funny and energetic ones. He wants to feel himself needed and important in the classroom. Only how to do it? He would be ashamed even to ask someone about something. How to overcome shyness?'

'Sofiika has won another victory. She is the best pupil. She goes to an English tutor, as it is the best way to conquer Europe. The dance troupe, in which Sofiika participates, has won the city competition and will perform in Canada. And yesterday it was decided that she would represent her school at a city song festival. In short, she is the prodigy and the best in school. Dianka looked at her classmate with envy, though it was difficult to admit it. Then she told her friend: 'There is no justice anywhere. Sofia's parents have their own firm that helps our school with the repairs. That's why she was awarded the first place.' What should be told and advised to Sofiika?'

'Maxym and Yura are friends. Yura complains that all decisions are made by his older brother and parents. His parents enrolled him on a dance studio, because they felt he needed to develop his creative skills. His older brother Mykolka determines which TV shows to watch. What should Maxym advise to Yurko?'

'Tymofii has quarrelled with his parents. Several of his friends already have gadgets. And he doesn't. Parents say that it's early for him. And why is it too early for him but not for his friends?'

Considering that a polysubjective environment is created in modern school (children are the subjects of education), it is reasonable to assume that problem-solving skills will be more effective if the case is filled by pupils themselves. Undoubtedly, it's not easy to admit that you are lonely, unrecognized, shy, unloved, envious and more. It is much easier to put into the case a description of a situation that seems to have happened to a friend, a peer.

So, the cases, that are filled by children themselves, are the way to develop the ability to solve problems. They can be considered during the lessons on the subjects 'I explore the world', 'I am in the world', 'Fundamentals of health', other subjects, when relevant topics occur, as well as during extracurricular discussions.

Reviewing the effectiveness of identified forms and methods, we have focused only on the dynamics of children's awareness of how to solve problems. Studying the correlation between knowledge and real-world practice is a prospect for further scientific exploration.

A diagnostic toolkit was developed to test the effectiveness of forms and methods of primary school pupils' problem-solving skills formation.

4.3 Formation level diagnosis of the problem-solving skill's cognitive component indicators

We did not find in the sources any results of scientific research to determine the diagnostic toolkit of formation level diagnosis of a problem-solving skill. Thus, in determining the indicators of the cognitive component (awareness of ways to solve problems), we focused on the author's classification of primary school pupils' problems, and on those problems that were mentioned in the questionnaires by pupils (they or their friends encountered them). Most often, children indicated a lack of free time (we came to the conclusion that children are not familiar with activities organization rules), that they or their friends are being abused (children need to know where to go, what responsibility comes to a child abuser), conflicts with seniors or peers (it is advisable to learn more about conflict resolution strategies), anxiety, anger (need knowledge, how to manage emotional states).

Thus, four indicators of the cognitive criterion were identified: knowledge of how to properly organize activities (training, sports, etc.); knowledge of ways to resolve conflicts; about emotional states and how to manage them; about the individuals and services that can help in difficult situations (rescue, psychological, medical, etc.). There are three levels of awareness of how to solve problems: high, sufficient, initial.

The level of each indicator's development was measured within 0.5 – 1 point. A pupil who received 3.5 – 4 points, as a result of conversations and tests, has a high level of cognitive criterion; 2 – 3 — a sufficient level; 0 – 1.5 — a low level of life problems' awareness. There is a 12-point rating system in Ukraine. Therefore, a high level corresponds to a score of 10 – 12; sufficient — 7 – 9; initial — 0 – 6.

Children with a high level of awareness know the rules of successful activity, how to define goals, how to achieve them and analyse results; know conflict resolution strategies, how to manage emotions, whom to address, and how to behave if you are being bullied or in another difficult situation. Mid-level children possess this knowledge only partially. Low-level children either do not know or know very little about the ways to solve life problems and solve them intuitively.

4.4 Experimental research organization

To test the effectiveness of the developed forms and methods of problem-solving skills formation, the experimental study was conducted among the fourth form pupils in four secondary schools in Ukraine: cities of Ternopil, Lviv and Khmelnytskyi and villages of Ternopil, Lviv and Khmelnytskyi regions. Four control (98 pupils: 46 girls and 52 boys) and 4 (105 pupils: 53 girls and 52 boys) experimental classes were identified.

Children were asked to answer a series of tests, including actions to take when they or your friends are being bullied, if there is a misunderstanding with the seniors or peers, there is not enough time for your favourite activities, you are anxious. Pupils also had to point out where to go in difficult situations and how the abusers will be punished.

Of course, these questions are difficult for pupils of fourth form. However, it made it easier for children to work with the options they could choose. At the same time there were provocations. For example, children could choose to deal with the offender with a small fight if they hurt you or a friend.

Unfortunately, 53% of pupils choose this option. And not only boys, but girls. 44% of those who believe that a small fight is a way to solve problems are girls.

Testing and analysing conversations with pupils allowed us to establish pupils' awareness of problem-solving skills: in the control groups, 3 children (3.1%) had the high level; 36 (36.7%) — sufficient level, 59 (60.2%) — initial level. In the experimental groups 4 children (3.8%) had the high level; 36 (34.3%) — sufficient level; 65 (61.9%) — initial level.

Subsequently, the educational process for the children of control groups was traditionally implemented; case methods were implemented in experimental groups.

Initially, teachers and pupils analysed situations made for pupils based on their answers to problems they or their friends had. Teachers emphasized that there is no universal answer to how to solve the problem. It

depends on many factors. Pupils were aware that when there was a problem, there were several ways of solving and then deciding which one was best.

While discussing the situations in cases, the teacher talked with pupils about ways to resolve conflict situations. It was not an easy task. Not all pupils understood at first what a word 'compromise' meant. It was necessary to explain that during the compromise it is necessary to yield part of their desires and take into account the wishes of the conflicting party. Children were taught how to find the phone numbers of trust services, social and psychological services that address the issues there. Conversations were held about the punishment of the abusers (fine, criminal liability, including imprisonment) as a way of punishing the abusers and their parents.

Conversations about the ability to plan their work and study carefully (weekly and daily) were important for pupils. The abilities to effectively organize learning are called praxeological. The Polish scientist T. Kotarbiński made a significant contribution to the development of praxeology. Polish teachers themselves call these skills competencies (Jablonski, & Ratajczyk, 2014). Therefore, the formation of the ability of primary school pupils to learn, plan training and other activities, to analyse their results is given considerable attention in the educational practice of primary schools.

Further, pupils of the experimental classes were asked to fill the case themselves in a variety of situations. A symbolic case was brought into the class (it was a computer case or a box made by pupils out of coloured cardboard) and pupils put small texts in it. Optionally, two or three pupils, using elements of dramatization, played out a difficult situation. And the actions of stakeholders were played out immediately.

For example, one of the pupils acted as a mother and the other one as a pupil of fourth form Victoria. Vika asked her mother to buy her a laptop immediately. Mum refused, because there was no money. Moreover, Vika had bad marks in math. They agreed that Vika would learn better, correct math marks, and wait a little longer, as there are other important purchases for the family. And only a little later she will receive the desired gift and recommendations how to use it with benefit.

Teachers informed pupils that the case would appear several times a year in the classroom. Therefore, they need to be attentive to their friends, analyse the events of their own lives to enclose their own text in the case.

Sometimes it is difficult for children to admit their problem. A pupil can write that this problem exists with a familiar peer and listen to the opinions of classmates, which they offer to solve a difficult situation.

The pilot work ended with the creation of an e-book describing the situations of the cases and how to solve these problems. All pupils in the class became the authors of this publication. They were able to supplement the book with other situations or new ways of solving problems.

There was an interesting communication with pupils about how all the little Europeans are learning to solve their problems. In particular, Polish schoolchildren also learn to do this and set scenes where they demonstrate how it is done practically (Gloskowska-Soldatow, Dudel, & Uszynska-Jarmoc, 2013).

After a year of experimental work, children were offered tests again. The results have improved significantly.

In the experimental groups, 25 (24%) children were already at a high level of pupils' awareness of how to solve problems. Only 23 (21%) pupils were at the initial level. 57 (55%) pupils were at a sufficient level. The results in the control groups remained almost unchanged.

The dynamics of pupils' levels of awareness of how to solve problems are shown in the table.

Table 1. Dynamics of pupils' levels of awareness of how to solve problems

Levels	Control group		Experimental group	
	Before the experiment	After the experiment	Before the experiment	After the experiment
High	3 (3,1 %)	4 (4,1 %)	4 (3,8 %)	25 (24,0 %)
Sufficient	36 (36,7 %)	38 (38,8 %)	36 (34,3 %)	57 (55,0 %)
Initial	59 (60,2 %)	56 (57,1 %)	65 (61,9 %)	23 (21,0 %)

The insufficiently high results of pupils' awareness of the ways to solve problems before the start of the experimental work are explained by the fact that a primary school pupil takes only the first steps in this direction. There are no mandatory and clear criteria for evaluating a set of knowledge and skills. In addition, children are overloaded with educational tasks. Teachers should first of all develop pupils' linguistic, mathematical and natural competences, where assessment criteria are developed and are of considerable value both in Ukraine and abroad.

We conducted a survey among primary school teachers to find out what difficulties they experience, while developing pupils' problem-solving skills. First of all, pupils do not want to listen to the advice they received while working together in the classroom (a small fight is still used as a way of conflict resolution, emotions often dominate common sense). Instead, children count with the opinion of the children from the yard, family

members, even if such advice contradicts the knowledge gained at school. We explain it with their immaturity, lack of life experience.

In a survey, 27 (39.7%) part-time students-teachers (68 respondents in total), admitted that they teach children to solve problems using conversations only partially. In the educational process, they focus on competencies that are assessed on a 12-point system, without which further learning is impossible. None of the respondents indicated that they use case study. This, in turn, necessitates the preparation of future teachers and the improvement of primary school teachers' qualification in the direction of forming pupils' cross-cutting skills to solve problems. According to the results of scientific exploration, the topics of conflict resolution strategies should be explored on the basis of situations' analysis, giving examples of compromise, cooperation, avoidance, adaptation using the method of dramatization. And then talk to your children, using different forms and methods, about ways to resolve conflicts, noting that there are usually several ways to resolve problematic situations in general and conflicts in particular.

5. Conclusions

Problem-solving skill becomes one of the most important, which is already acquired by pupils in primary school. It enables primary school pupils to develop, move forward constantly, achieve new successes, which ultimately provides the child with inner harmony.

The most common problems of primary school pupils are cognitive, procedural, problems with communication, recognition, emotional states, security. Although this division is relative, it allows comprehensive consideration of difficult life situations.

Effective methods for acquiring problem-solving knowledge are case studies, integrated with interactive ones. Solution of difficult situations, offered in the cases, enriches children's experience, gives the opportunity to gain new knowledge, convinces that there are many alternatives from which to choose the most appropriate ones. An effective form of awareness-raising for solving life's problems is the e-book compilation, which reflects the results of the case-study method, integrated with interactive ones (group work, 'Aquarium', dramatization, etc.).

The experimental work results' analysis showed that the level of awareness of the ways to solve the problems was significantly increased in the experimental groups. The number of high-level children has increased (from 3,8% to 24,0%), and the number of initial-level children has decreased

(from 61,9% to 21,0%). The number of high-level children has increased by almost six times and the number of initial-level children with the knowledge of solving vital problems has decreased threefold.

The prospect of further research is to study how awareness levels affect the real state of problem solving. If you know, it doesn't mean that you can.

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