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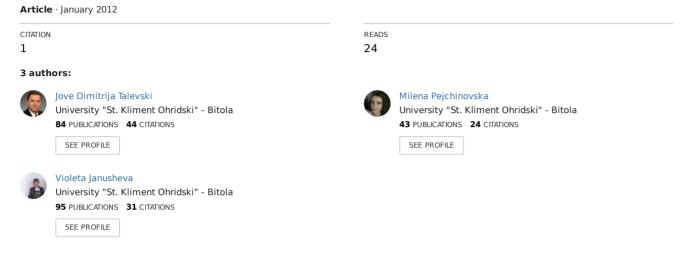
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TEACHING IN CLASSES WITH RESEARCH TECHNIQUES - CASE STUDY IN THE ELEMENTARY EDUCATION IN REPUBLIC OF MACEDONIA

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Abstract

In our country, in the past two decades, serious attempts have been made to make the educational process more effective in order to achieve optimal development of pupils' competencies, primarily, via programs and strategies for their active involvement in the process of learning. With this regard, the main purpose is to influence the most important segments of the educational process (EP), such as the process of pupils' learning and the one of teaching, which should be directed to practical competences development that will enable pupils to participate independently in changes and events in all segments of everyday life. In that sense, based on the insight of relevant institutions about the need for modernization of EP, at the Faculty of Education in Bitola, within the project Modernization of the education in the Republic of Macedonia, the program Learning through research was designed for training the teachers who are already involved in EP. Our paper presents the characteristics and practical implications of the Learning through research training program whose main goals were to deepen the knowledge of teachers about the research techniques (RTs) in elementary education, to train teachers for didactic-methodological designing of daily classes by use of RTs, to develop pupils' learning competences through research as well.

Our paper, in its essence, is a case study, which from the teachers' perspective, gives a presentation of teaching and learning implications of Learning through research (LR) program in elementary education in the Republic of Macedonia.

Key words: *teaching, active learning, research techniques*

1. INTRODUCTION

As a result of the new tendencies and changes in all aspects and segments of social life, the school should be the place where the basis of the social development is formed, and the pupils should be the future researchers who will provide their own social and personal progress and development through independent research activities. In that sense, the role of the pupil in class has been changed. Pupils are now active participants who are being trained for independent learning, their ability for self-assessment of the personal progress and learning is being developed, and the motivation emerging from the clarity of the goals that are set and from the wish for achievement of the same (intrinsic motivation) is being built in and developed, pupils easily and freely communicate in interpersonal relations, use their own initiative and are capable of choosing alternatives, they are methodologically skillful, know and use research methods etc. In this regard, the development of pragmatic abilities for independent participation of pupils in daily changes and events is of great importance. Therefore, utmost importance is also given to the use of appropriate methodological approaches in realization of the teaching process in elementary schools in the Republic of Macedonia, which will make the active

learning more effective and will bring about the development of practical competences with pupils. Teachers' didactic-methodological training is one of the key factors upon which the extent of the development of these competencies with the pupils depends. It is due to this stated factor that the idea for an Elementary Education Teachers' Training Program emerged, designed for teachers already involved in the educational system in the Republic of Macedonia to be trained for effective application of RTs in class, which would lead to active participation of pupils both in teaching and in learning[1]. The more appropriately used in teaching, the more satisfactory the results of the class are, and the pupils develop a more solid basis for independent learning through research. Contemporary research of this didactic-methodological issue suggests that teaching with RTs is an efficient way for pupils to become independent, capable, creative beings of sharp judgment.

Teaching through RTs is a set of procedures with research characteristics, by the use of which the teacher deliberately directs the pupils' learning. RTs are infallible part of the research process[2], but in practice, very often in the first cycle of elementary education, RTs are applied as independent techniques in realization of the content[3]. LR is a learning approach by application of RP and includes the activities of pupils (and of the teacher) during the RT observing, comparison, experimenting etc. In order to realize LR and the research process successfully, aside from the many conditions, it is necessary to choose appropriate RTs with certain activities of the pupils, which should correspond to the research situation that proceeds from the objectives and contents of the lesson.

The analysis of the Program content, of the data of the survey questionnaires and informal conversations with the teachers, shows that the need for their further methodological training and for development of the skills for applying the RTs in teaching, which will result in improvement of the process of pupils' learning, is necessary. Namely, this situation primarily emerges from the fact that a large number of the teachers didn't have courses in methodology of research and in strategies of learning and teaching in their diploma studies[4].

The training program is based on the principles, methods, and techniques for teaching adults. The methods and techniques which used in the training program, and taken into consideration during the analysis of particular aspects of teaching with research techniques in class are: discussions, simulation exercises, survey and informal conversations with teachers.

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[1] In order LR to become one of the primary approach for gaining knowledge and skills, primarily in the natural sciences field, through authentic situations in practice, the teachers are trained for application of the research process and RTs in class and to incorporate them in the students' learning styles so that they contribute for the improvement of their achievements.

[2] The research process in the methodological literature is differently defined by individual authors, but an attitude prevails that the process be performed in six phases stated further down in the paper. Following the goals of the paper, we do not go deeper into the definition of the research process and the stages of the research, s. Цветко Смилевски, (2006): 37.

[3] Бојо Колонџовски, (2001): 75.

[4] In the background education of the subject teachers, aside from pedagogy and psychology, as well as the basis of the methodology of the given subject to be taught, other didactic-methodological content was not included. But, the current reforms in the high education are now following the course of expanding the didactic-methodological training of future teachers; therefore, nowadays this situation is considerably improved.

2. BRIEF DESCRIPTION OF THE PROGRAM, APPROACHES, TEACHING TECHNIQUES AND METHODS APPLIED IN TEACHERS' TRAINING

The initiative of the Ministry of Education in the Republic of Macedonia and the Bureau for development of education, in accordance with the National program for the education development in the Republic of Macedonia, resulted in a project of statewide innovation of the educational process. Namely, within the project *Modernization of education*, the relevant institutions funded by the Dutch government announced the tender for training courses for teachers in elementary education, offering a variety of content appropriate for the teaching process. The relevance of the program of the training courses was determined on the basis of the overall previous analyses for the teachers and pupils' needs in the educational process in the Republic of Macedonia. In addition, the elementary schools were free to choose from the offered programs both the bidder of services and the content reflecting their needs for working with pupils. In that regard, on behalf of the Faculty of Education in Bitola, training program based on the pupils' active participation in the process of learning was designed and, upon its relevance, accredited as *Learning through research*, the main goal of which was the development and deepening of teachers' knowledge about RT application in class.

The project was being realized in two stages. The first stage included the theoretical and practical part preparation of the Training Program, and the second stage included the practical/field realization of the Training Program in the period from January 23 till May 7, 2010. In the realization of the second stage, altogether, 87 class and school-subject teachers from seven elementary schools from all around Republic of Macedonia participated.

Table 1. Quantitative presentation of the LR training program content according to topics and sub-topics and their realization (number of classes and schedule of realization)

Topics and sub-topics of the elementary school Teachers' Training Program	Classes	Schedule of realization
Notion, definition and meaning of the research process and RTs in the class	4	1
Goals of RTs in the class	1	2
Teacher's and pupil's tasks in the RTs in class	1	3
Particular review of the teacher's mentor role in the RTs	1	4
An individual and whole-group approach in the application of RTs	4	5
Observation in class – components, stages and types of observation	3	6
Survey and interview and their application in the class	3	7
A case study – who, when and why to use a case study?	6	8
Role-play	5	9
An experiment and its application in the class	1	10

The realization of the Training Program content was based, in the first place, on the principles and methods for teaching adults – everybody learns from everybody because everybody has some knowledge (a cooperative learning), the content was elicited from everyday life situations significant for the participants and altered through their common experience, developing self-confidence and respect with the participants. Adults have strong internal motivation to learn something new and thus, those were encouraged to use their own experiences as learning resources. Problem situations were set before them to take active roles in.

The adult teaching procedures that were used most are as follows: experiential procedures (group discussions, simulation exercises, activities directed to problem solving, study cases). As the most common procedures in the realization of the training content we select the following: presentations, brainstorm, demonstration, small group discussion, large group discussion (reflection, analysis and application), simulation, role-play, survey, interview, experimenting, work in pairs, work in small groups, walk-in-a-circle.

The methods that prevailed in the realization of the contents of the program are as follows: dialogue, method of working with text, method of problem solving, method of oral presentation etc.

At the very beginning, we started with the determination of the level of prior knowledge of the teachers involved in the training. The general conclusion was that the groups were homogeneous. Homogeneity was expressed in terms of the level of education, the prior knowledge of the teachers and in terms of their methodological competences to apply the research process and RT.

Table 2. Structure of participants in training

	Level of education		
	Non-university education	University education	Master's degree and higher
Position/s in school			
Headmaster		2	1
Teacher-in-charge-of-a-class	3	24	
Subject coordinator	1	18	2
Class teacher	2	21	2
Subject teacher	3	5	2
Pedagogue		1	

The methodological framework for goals of this paper includes: research procedures and instruments, methods of scientific knowledge and methods of scientific conclusion. In this sense, the research procedure where by the data on the practical implications of the program was obtained was the survey via questionnaires for the teachers at the end of each working day and at the end of the Training

Program content realization. Furthermore, there were discussions and informal conversations conducted with the teachers about the practical implications of RT application in the teaching practice.

Scientific knowledge was based on the causal-descriptive method, and the methods for scientific conclusions were: method of deduction, analysis, and synthesis.

3. GOALS AND TASKS OF THE TRAINING PROGRAM *LEARNING THROUGH RESEARCH*

Why teaching with RTs? The objectives of the program proceed from the efforts of all institutions relevant to improve the teaching performance, one of the most important segments of EP in the Republic of Macedonia, via pupils' active participation in the process of learning by means of RTs. The task of the program is to improve the teachers' methodological competence in applying RTs (observation, survey, interviewing, study case, experimenting etc.) in class, which yields better results. Furthermore, the task of the program is to allow pupils more effectively to: become independent in planning and make a more realistic assessment of the way leading to the solution of a situation/problem; improve communication skills at all levels through the established interactive and communication relationships; improve socio-emotional relations in the group; become capable of taking initiatives and venturing future research exploits etc.

Teaching by application of RTs and LR provides the *pupils* with the following benefits: motivational classes with a navigation towards active dealing with problems, changes, and current events; training in independent planning and making more realistic assessments; training in self-evaluation of the achievements in learning process, improving the communication through interactive mutual relations, improved cooperativeness; training in taking initiatives; stimulating and holding down pupils' interest and spurring and developing the motivation for learning; spurring and developing creativity and critical thinking; training in the use of different resources of knowledge within the learning process; ensuring everlasting knowledge applicable in practice etc.

The main benefits of teaching by application of RTs for the *teachers* are: broadening and deepening of knowledge about RTs and their significance for the research process; active inclusion of pupils in the process of learning by selecting appropriate RTs; ability of pupils to independently apply the RT's when being taught; to design everyday classes in a didactic-methodological way by using RTs in terms of optimal development of the pupils' competences etc.

4. ANALYSIS OF PROGRAM CONTENT FROM THE ASPECT OF PRACTICAL IMPORTANCE FOR TEACHERS

The content of the program was realized through various activities given in three parts: activation of the teachers' prior knowledge, theoretical approach to the research process and the specified RT and to the possibilities for its application in practice. In addition, the teachers were independently and freely expressing, discussing and analyzing their own opinions and views.

The beginning of the second stage, respectively the practical realization of the Training Program started with the workshops content and activities regarding the notion, definition, and the meaning of the research process and RTs in class. The methodological training of teachers to use the research process was conducted in six phases: 1. Identification, definition, and concretization of the research problem; 2. Designing a research plan or project; 3. Implementation, conduct and application of the

research methods, techniques and instruments[5]; 4. Data processing and hypothesis verification; 5. Analysis and interpretation of the results and deducing conclusions from the research; and 6. Writing-up and publishing a report, and presentation of the results of the research. Moreover, the teachers' training in teaching with the use of the research process started with their prior knowledge.

Discussions during the activities in the workshops and the teachers' stands analysis in terms of the theoretical approach and the practical application of RTs in class indicated that their knowledge about RTs and the research process in class deepened and widened, as well as the possibilities for the application of the same. In that regard, the benefits, the significance, and the role of RTs and the research process in acquiring the content in elementary education are presented in the following statements of the teachers: *by means of RTs an issue or a problem for which an answer must be found using a variety of resources is set up; by using RTs the pupils are faced with authentic situations similar to those from real life and they can more easily deal with them later on; with the use of RTs all intellectual capacities of the pupils are put into action; the pupils are being faced with real situations and learn to critically think, make research, look for answers to their questions, collaborate, work in teams etc.; RTs help the pupils to become able to live in the real-life society; RTs encourage the independence, improve the work in groups, the team work, and the leadership; RTs reduce absence from classes through frequented cooperation; RTs enable the pupils to use their knowledge further in life*. As advantages of the application of the research process in class the following ones are mentioned: *team work, leadership, enterprising spirit, communication skills, critical thinking etc.,* and disadvantages of the application of the research process in the teacher's practice before the training, are expressed with the following statements: *insufficient knowledge to formulate: a phenomenon, a problem, a goal, an objective, hypotheses in a research; difficulties when accessing relevant information, library, computers and alike, insufficient knowledge to discern relevant information about the question set or the objective to be reached; insufficient knowledge to analyze the information; difficulties when stating sources etc*.

Further on, a very important thing to be pointed out is that it was realized what a liable role and tasks both the teachers and the pupils have with RTs in practice for the class to get the desired effect. In the RT application, the teacher's task is: to give the necessary assistance to the pupils when they are thinking of the solution of the problem and learning via research; to pay attention to the prior knowledge of the pupils and to set the research problems in accordance with it; to motivate them to recognize facts and to generalize the ideas and presumptions; to take into account to what extent the sources offered to the pupils are available; to take into account whether pupils are previously trained to use the resources, for example, whether they have been trained in using computers or they need any additional training in the use of the same and alike.; to make sure that each pupil clearly knows his/her role and responsibility within the group; to train the pupils in reflection and integration of what has

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[5] In the literature of methodology, the term *research techniques* is a frequently used phrase which can be considered a synonym to the term *research procedures* used in our terminology, s. Цветко Смилевски, (2006): 110. Furthermore, methodologists do not have a concerted stand for distinction between the concepts of research methods and research techniques. Thus, the observation, the experiment, etc. are sometimes called research methods, s. *Research Methodology: An Introduction*, (2012): 7. However, the prevailing opinion is that research techniques and research instruments are the constituents of the research methods. For instance, possible research techniques within the research method *Examining documentation* are: content analysis, statistic operation, organization, while research instruments are analytical lists, records and alike.

been learned; to train them in evaluation of the acquired competences with RTs, evaluation of the methods, techniques, instruments and alike etc.

In this sense, the very complex role of the teacher in LR is seen, as s/he necessarily has to put the RTs in correlation with the goals of the class. By way of illustration, the teacher is to plan what types of cognitive, affective, and social competences s/he wants to develop with the pupils in LR by using RTs (for example, to train them in making a clear comparison among: the phenomena, the processes and the objects; to train them in team work etc.); what meta-cognitive competences s/he wants the pupils to develop (to think about LR, to direct the pupils to evaluate the effectiveness and efficiency of the methods that would improve LR); and has to think about the kind of the problem that s/he wants his pupils to solve (to get trained to make research, to apply scientific methods); has to decide on/think of the concepts and principles that s/he wants used by the pupils (for example, the application of the basic principles of ecology and environment protection in their life and knowledge about the relations between the cause and effect)[6]. In that regard, the teacher's lesson plan for learning through research may include the following questions: *Which goals do I want to attain with RTs (gaining knowledge, developing skills etc.)? How should I make the groups? Which questions should I pose to the pupils in order to motivate them to research/learn? Which resources do they need? How to prepare and involve the pupils in work? How should I navigate the pupils' work?*

Some of the pupils' tasks in LR with RTs are to: do a research, to perceive, to compare, to contemplate and produce ideas; to search for and find solutions; to collaborate with each other and with the teacher; to reflect; to apply their prior knowledge in new situations, to learn through experience, use a variety of resources, evaluate their work; think critically, solve problems etc.[7]

The training proceeded with workshops in which the importance of the RTs *observing, surveying, interviewing, study case*[8] etc. and their application in class was pointed out.

Observation in class. The observation is an appropriate, systematic, and organized RT for understanding the objects, phenomena, and processes, and the teacher is responsible for making the observation active, consciously directed and organized.

Therefore, the goal of the Training Program is to train teachers in effective use of this RT in class via the content *Observation in class - components, phases, and types of observations[9]*. In that sense, the teacher should make sure that the pupils become familiar with observation as an act of understanding the reality first, and then to train them to use it on their own.

There were also some conclusions that proceeded from the teachers' discussions regarding the pupils' training in observation: ensuring a permanent flow of senses information for thinking processing that should always serve the goal; familiarity of the pupils with the goal, namely, when training the pupils to observe, the teacher should guide them towards defining the goal of observation until they are trained to independently define the same; training the pupils to discover the aspects of the goal, to analyze facts, relations, to compare, and etc., to plan and perform the observation, firstly by sticking to

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[6] Herman, Achbacher, Winters, (1992).

[7] Милена Пејчиновска, (2012), *Хоризонти II,* 7: 670-673.

[8] Contents for experimenting and playing roles as important RP in the class, which are not to be analyzed for the papers' goals, were pointed out, Violeta Janusheva, Milena Pejchinovska, (2011): 439-44.

[9] Милена Пејчиновска, (2010), *Хоризонти,* 6: 413-416.

the offered phases of the observation performance, and then through an independently designed plan, to collect and sort data, to make conclusions and to present findings, to evaluate the successfulness of the observation so that they can form a critical attitude towards the results etc.

The advantages of RT observation in acquiring the content of the teaching programs in the elementary education are summarized in the following statements of the teachers: *with this RT a close observation of the object, the process, or the phenomenon is provided; the organized, well-planned, and systematic observation leads to a formation of rich, concrete perceptions and notions, which is especially important for the future processes of generalization and formation of the concepts*; *by means of this RT authenticity of the situation is provided and the aspects observed in accordance with the goals of the teaching are easily singled out*. The opinions regarding the disadvantages are: *a possibility to observe the problems current at the time of the observation but not the past ones*; *the characteristics of the social phenomena are very difficult to follow*; *the observation often is slow and the data can be very difficult to access, confidential etc.*; *destination, object, or process either in danger or inaccessible* and alike.

Questionnaires and interviews. Through the Training Program the teachers grew familiar with the characteristics and the use of questionnaires and interviews. After the training the teachers declared that they were trained to: *to explain the possibilities of questionnaires*; *to indentify the disadvantages and advantages of using questionnaires depending on the problem of the study*; *to use questionnaires as an RT in the classroom simply and easily*; *to create and design practical formats of questionnaires*; etc.

Regarding the interviews, the teachers expressed their opinions that the exercises at the Training Program enabled them to: *explain the possibilities of using the interview as an RT in the research process in the classroom*; *to identify the problems and advantages of using interviews; to use interviews simply and easily* etc.

A case study of RT in class. The case study (CS) as an RT in class enables a contextual use of theoretical knowledge in solving practical problems. The pupils are faced with real life problem situations for which they find solutions, most frequently when working in groups, in addition with the CS the educational process realization focuses on the pupils and not on the teachers as with the traditional approaches to education. In the Training Program, teaching with CS encompassed groups' generating and offering possible solutions to a set problem, giving reasons for the solutions and deciding on the priorities that would optimally solve the problem/the situation.

Starting from the fact that learning through CS is active learning which promotes teamwork and synergic problem solving, this act is of great importance because of the value of the practical knowledge acquired through real situations. The following statements are some of the statements reflecting the opinions of the teachers regarding the question on the importance of this technique for LR: enhanced interest and motivation with the pupils for the subject; teamwork and positive interpersonal relations; acquiring independent research skills; acquiring skills for selection and elaboration of the collected data; a development of the presentation and communicative skills.

Further down some of the teachers' opinions on the ways in which CS can be developed and used in class more effectively are stated.

In order to develop an effective CS, it is necessary: that the school's interests and needs with the research be considered and taken as the most preferable starting point (and this refers primarily to the vocational schools and their goals, to their connecting with the labor market through training in solving practical problems from the area of interest; that the personal research interests of the pupils be

considered; the possibility of including visiting lecturers, experts, and professionals in the fields such as industry, civil engineering, architecture, and alike, who are the guarantee for an effective development of CS from the very beginning by sharing their experience in that field (with regards to the topics that they work on, the strategies that they apply and alike) etc.

With regard to the use of CS in class, the teachers pointed out the CS-in-class plan as a very practical and simple one:

Steps for development of CS upon a concrete problem chosen to be researched	
1.What are the specific reasons for using CS for this problem? (what should the pupils develop, pupils competences, what are the goals to start from, etc)	
2.How was CS designed?	
- Duration	
- Level	
- The objective of CS (see number 1)	
- Main skills that will be developed with the pupils	
- Evaluation (what to evaluate, what to use for grading the final result of the pupils, whether to evaluate in the course of the CS or only at the end etc., whether to grade a final presentation or a test on the problem researched?)	
- Additional material for the pupil	
3.What is the role of the teacher and what is the role of the pupils?	
4. Realization of CS - Each member of each of the groups makes his/her own list of the 5 most important solutions necessary for solving the subject of research	1._____ 2._____ 3._____ 4._____ 5._____
A final list of 5 most important solutions is made in the group according to priority and the reasons for the same are given.	1._____ 2._____ 3._____ 4._____ 5._____
5. A presentation (in front of all of the groups, with one representative presenting)	
6. Discussion	

It can be clearly seen from the analysis of the program, from the standpoints and contemplations of the teachers, primarily from the aspect of its practical implementation in the teaching process and from the aspect of the pupils' benefits that the Learning through Research Program has accomplished its goal.

5. ANALYSIS OF THE DATA FROM THE QUESTIONNAIRES ANSWERED BY TEACHERS ON DIFFERENT PROGRAM ASPECTS

The teaching implications of the training program LR are evident from the analysis of the teachers' statements in the questionnaires at the end of each work day and at the end of the training (the fifth day of the realization of the Program).

a) How do you evaluate the effect of the content realized in *Learning through Research*? b) How **do** you evaluate the need for an active inclusion of the pupils with the use of RT in LR?

completely true 4	quite true 3	partially true 2	less true 1
63	22	2	0
highly necessary 4	quite necessary 3	quite unnecessary 2	mainly unnecessary 1
45	40	2	0

Commentary: As the tables show, the effects of the realized content and the workshops are quite satisfactory. The quality of the content offered regarding the teaching effectiveness, the possibility of an active inclusion of the pupils in the teaching process, the optimal realization of the goals that were set, is estimated as a very good one by most of the participants. Further on, most of the surveyed teachers point out the necessity for active didactic-methodological solutions and that those based on the learning through research approach - with the use of RT, are quite necessary in the elementary education.

c) The methods, the practical implications of RT, and the methodological findings are useful for your future work!

completely true 4	quite true 3	partially true 2	less true 1
59	26	2	0

d) After the training program LR you have a greater knowledge about RT and about the research process covered with the training**!**

completely true 4	quite true 3	partially true 2	less true 1
52	33	2	0

Commentary: The content of the program and the research methodology became clearer for most of the participants at the end of the third day of the training. Most of them evaluate the content and information obtained in the workshops as useful for their future work. The number of participants with increased level of knowledge about the topics covered with the Program is significant; the methodological knowledge about the research process and the meaning and use of RT in the pupils' learning has deepened. It is a sufficient indicator of the pupils' progress regarding the practical implications of the knowledge acquired with the Program in the teaching practice towards a more effective learning process with pupils.

e) Which methods of teaching, content, and practical exercises from the training did you like most?

Participants' statements	Frequency
The discussions	9
A possibility for expression, sharing experiences	4
The organization, work materials, the approaches in explanation of the unclear aspects of the techniques	12
The collaboration and communication among the instructors and the teachers	8
The joint work and work in groups	1
The mode of presentation	7
The communication within the groups	2
An excellent program, clear, comprehensible, solutions practically applicable, giving sufficient information about RT	4
I am very pleased, I learned through this Program how to get to a complete research by surveying.	3
I like the lecturers' approach	6
Familiarization with the observation process as an RT, with the help of which all senses of the pupils are involved.	5
All practical workshops	9
The research work methods	5

It is evident that the statements of the teachers that stress the commitment to ensure practical implementation of the offered content in the everyday practice with the Program are the most frequent ones. Furthermore, the statements that stress the convenient way in which the content is presented and the unclear aspects of the methods are explained are outstanding. As shown by the teachers' statements, the fact that one of the considerably important goals of the program was realized is very important, which was to give the pupils an opportunity to express their comments freely and autonomously and show their experience as a source for learning as much as possible through the Training Program in a direct way.

6. TEACHERS' OPINIONS AT THE END OF EACH WORKDAY ABOUT THE TEACHING BY USING RT IN THE PROGRAM

The analysis of the opinions obtained from the questionnaires within the Training Program confirmed the need for using RTs during the learning process. Their application in the field of natural sciences is especially important, where teaching should be based on practical performances by the pupils.

a) Successful accomplishment of the goals set by using RTs. Out of 87 teachers, 33 or 34% of the surveyed teachers answered that the teaching knowledge and skills obtained with the help of RTs during the training improved and lead to a great success in the realization of the goals set in classes. 29 of the surveyed teachers (30%) answered that their teaching skills with the help of RTs largely improved with regard to the successful accomplishment of the goals set, whereas the teaching skills and knowledge with 18 of them (19%) improved considerably, on the basis of which they successfully accomplished their goals set in the classes.

b) Creating a positive and productive environment and a good communication by using RTs. The use of RTs and the creation of a positive and productive environment and communication with the pupils are all expressed through the following teachers' opinions: 20 of the surveyed teachers (21%) answered that the use of RTs had a great influence to the creation of a positive and productive environment, 34 of the surveyed teachers (35%) stated that these actions had great influence, 27 of the surveyed teachers (28%) stated that these actions had some influence, but that it depended on numerous other factors in EP, while the opinions with 11 of the surveyed teachers (11%) show an unchanged situation.

c) Activation of the interests and motives of the pupils by using RTs. The motivation for work and the instigation and holding the interest of the pupils during the realization of the teaching contents with the use of RT are shown in the following teachers' opinions. Namely, 24% or 23 of the surveyed teachers think that the situation of the activation of motivation and interest of the pupils has been significantly improved by using RTs in class, 26% or 30 of the surveyed teachers think that the situation of the activation of motivation and interest of students has been greatly improved, while none of the surveyed teachers thought that the situation of instigation and keeping motivation and interest of pupils has not been improved with the use of RTs. With the situation determined as such, a conclusion can be drawn about the efficiency and effectiveness of LR in the realization of the teaching goals regarding the instigation of motivation, as well as holding and increasing the interest of pupils.

d) Possibility for application of the research process in class. The teachers' opinions regarding the application of the research process in class after attending the Training Program are as follows: 21 of the teachers (22%) have improved their ability to notice the problems in the realization of the teaching content that can be taught by applying the research process in LR. 31 of them, or 32%, have frequented the application of the research process in realization of the teaching contents in class. 28 of the surveyed teachers, or 29%, use the research process when there is an opportunity for that, in accordance with the objectives and content of the lesson.

7. CONCLUSIONS

It is evident that although at present the development of the pragmatic competences of pupils is increasingly being taken into account, the process of learning should continuously be improved and made more effective**.** Moreover, the strategies for learning and teaching and the active approaches in the process have great significance. Therefore, the objective of the program *Learning through*

Research was to raise the awareness among the teachers for the importance and the role of teaching with RTs in EP and promotion of teachers' skills for their effective implementation, in order to increase the activity and the involvement of the pupils in EP. In EP, the need for methodological training of the teachers can still be felt, and it is a joint goal of all relevant institutions in the country. Namely, no methodological items and didactic-methodological content were included in the subject programs of the prior education of the school-subject teachers. In line with this, it was of great importance for the teachers to be able to apply the research methodologies in the learning process of the pupils. Thus, the Program is related in its essence to the upgrade and development of the teaching staff that will be able make the learning process more effective, while the pupils will be actively involved in the learning process.

From the case study in this paper, it can be concluded that linkage of theory and practice as a very important component was achieved through the completion of the project, by which the aspirations of the Ministry of Education and the Bureau for the Development of Education in the Republic of Macedonia to revive the programs for training in practice and for the purpose of this kind of professional development of the teachers for the learning process of the pupils was confirmed. The content of the Training Program contributed to the expansion of the methodological knowledge of the teachers, along with the expression of willingness and ability to apply the learned in an everyday educational workplace. It was evident that the teachers had motivation for the didactical-methodological modeling of classes by applying RTs in teaching in their daily educational work. Most of the participants in the training clearly emphasized that the offered contents are characterized with very high effectiveness in terms of their teaching characteristics, with the possibility of actively involving pupils in the learning process, as well as the opportunity for optimal realization of the set goals, etc.

The study has led to the conclusion that after the implementation of the program, the research methodology has become clearer, and that the offered content and information obtained from the workshops are very useful for the future work of trainees. This unambiguously alluded to the personal professional progress of the participants in terms of practical implementation of methodological knowledge, knowledge for the application of the research process, the meaning and application of RT in the learning process, etc.

It is very important to emphasize that the knowledge of the participants was enriched through the Program thanks to the open discussions after each activity in the workshops, which in a direct way put forward their own experience as a learning source.

The importance of active methods and the application of RTs in teaching practice were also noticed. Namely, the advanced teaching skills through training, with most trainees, have led to a greater success rate in the realization of the goals set by using RTs and the research process.

In addition, the study has led to the conclusion that the application of RTs in classes has created a positive and productive environment that has improved the communications among the pupils. Also, the general conclusion is that the efficiency and effectiveness of RTs in the realization of the teaching goals encourages motivation and it holds and increases the interest of pupils in the process of learning.

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