Scientific research activity organisation and improvement in a primary school

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ABSTRACT

Scientific research activity (SRA) is very important in an early natural science education process. Basically, it comprises primary general education school. Natural science education process construction based on experimental-research activity is acknowledged at an international level as an effective educational approach. However, it is still very little/not enough known about teachers' position (opinion) concerning research activity aims, research activity organisation and realisation, scientific research competence of the teachers themselves. The main students' SRA organisation aim is to give an opportunity for the students themselves to try scientific method application, in this way acquiring and broadening natural science knowledge. Such an activity in its turn is undoubtedly practical and requires students' creativity and proper motivation. The conducted research aim was to analyse primary class teachers' position in the scientific research activity sphere (personal ability to organise and carry out students' research activity evaluation, revealing the most important limitations, understanding of SRA importance and ways of improvement). 60 primary class teachers from more than 25 Lithuanian general education schools participated in the research. Data were analysed using a content analysis method. It has been stated, that most of the teachers value their abilities in SRA as satisfactory, though they treat the importance of SRA itself in education process as very significant. The essential factors hindering SRA development in a primary school were ascertained, i.e. supply limitations related to material and financial difficulties and organisational/ human factors.

KEYWORDS

Content analysis, qualitative research, primary school, scientific research activity

RÉSUMÉ

L'activité de recherche scientifique (ARS) est un élément essentiel du processus d'éducation précoce. Fondamentalement, cela comprend de l'école primaire d'enseignement général. La construction du processus d'enseignement des sciences naturelles sur la base d'activités de recherche expérimentale est internationalement reconnue comme un accès effectif à l'éducation. Cependant, il existe toujours une connaissance insuffisante de la position (avis) des enseignants sur les objectifs de l'activité de recherche, l'organisation et la réalisation des activités de recherche et les compétences des enseignants eux-mêmes. L'objectif principal de l'organisation des élèves ARS est de permettre aux élèves d'expérimenter l'utilisation d'une méthode scientifique, à la fois d'acquérir et d'élargir les connaissances scientifiques. À leur tour, ces activités sont sans aucun doute pratiques et nécessitent de la créativité et une motivation appropriée de la part de l'élève. L'objectif de la recherche était d'analyser la position des enseignants du primaire dans le domaine des activités de recherche (évaluation des capacités personnelles d'organisation et de conduite des activités de recherche des élèves, révélation des principales limitations, compréhension de l'importance de ARS et des moyens de l'améliorer). L'étude a concerné 60 enseignants d'école primaire de plus de 25 écoles d'enseignement général Lituanien. Les données sont analysées par la méthode d'analyse de contenu. Il a été déterminé que la plupart des enseignants accordent une importance satisfaisante à leurs compétences en ARS, bien qu'ils considèrent que l'importance de l'ARS lui-même soit très importante dans le processus d'éducation. On a identifié les facteurs essentiels empêchant le développement de ARS à l'école primaire, à savoir, les contraintes du côté de l'offre liées aux difficultés matérielles et financières et aux facteurs organisationnels / humains.

MOTS-CLÉS

Analyse de contenu, recherche qualitative, école primaire, activité de recherche scientifique

Introduction

Natural science education in a primary school is not only important but also problematic. The importance first of all lies in the fact, that natural science education is an inseparable part of general education (Lamanauskas, 2008). In 2015 research report on national students' achievements it is said, that it is necessary "to become concerned about the quality of natural and social science education basics laid in primary classes and to seek, that the percentage of the fourth formers, who reach a higher achievement level of world cognition, would increase (National student achievement studies 2015, 2015).

Scientific research activity (SRA) is a complex, manifold sphere. It can basically be considered a compound part of natural science education process. Depending on education level (e.g., primary school, which in this case is understood as 1-4 form or 7-12-year-old students) this activity is different. The concept "scientific activity" is often treated as inappropriate speaking about younger age student natural science education. In Lithuanian and other country educational practice, the term "practical research activity" or "natural science research activity" or just "scientific inquiry" is more often met. However, the first scientific research activity abilities should be formed already in a primary school. Such activity is very wide. Students observe various changes, fix the facts, predict possible results, analyse raised problems, eventually learn to apply the scientific method. It is very important for the students to learn to work and think as real researchers: discuss, express one's opinion, perform simple and interesting research. Teachers practitioners notice, that research in nature, observations, experiments, tasks give students an opportunity to accumulate experience, to cognise more profoundly and be convinced of nature and fauna adaptation, relatedness and survival importance (Lukočienė, 2017). SRA comprises various forms. This is not only activity during the lessons, but also extra-curricular activities. Research days, conferences, Olympiads, festivals, projects, press conferences are organised and so on (Savičienė, 2013; Lukočienė, 2018; Petrauskienė & Vėželytė, 2018). It is obvious, that working as an active nature/environment researcher, a student pays attention to its diversity, investigates the environment and collects exhaustive, universal data about it. On the other hand, scientific research activity in a primary school is specific in that sense, that it is necessary systematic teacher's encouragement and adjustment. SRA forms possibilities and encourages students to work with various sources: books, newspapers, magazines and so on. In order to get a positive SRA result, a teacher has to positively evaluate and to show students the perspective (to encourage). The teacher should be able to guide scientific research activity of his/her students.

Natural science education comprises various components - ecological, environmental, healthy lifestyle, harmonious development and other. Experimental-research activity is of great importance. Effective all component integration in the education process in primary classes remains problematic. This is actual not only in Lithuania. Foreign country researchers state that still it is little known about teachers' attitude concerning research activity aims, research activity organisation and carrying out processes, finally about teachers' motivation to perform a more complex research activity (Keys & Bryan, 2001). It is also acknowledged, that experimental-research activity is one of the most complicatedly realised and managed education forms. It is natural, that primary class teachers must have the proper experience, in order to encourage deeper natural science education development (knowledge and understanding). SRA strengthens and develops creative students' abilities, forms possibilities not only to use information, but

also to create it (Markova, Rezvanceva, Storozheva & Judkina, 2017). Thus, primary school students' scientific research activity organisation is serious and complex work, requiring high level knowledge, ability to apply various animate and inanimate nature object research methodologies and other. Research activity stimulation, curiosity supporting, desire to experiment, to independently search for truth is one of the essential teacher's ambitions.

Also, in researchers' opinion, possibilities have to be formed for the teachers to practice integrated experimental-research work activities and to develop research abilities (Jeanpierre, Oberhauser & Freeman, 2005). Natural science education process construction based on experimental-research activity, at an international level is acknowledged as an effective educational approach (Moeed, 2013). It is obvious, that if teachers have limited understanding about experimental-research activity (in general, about research/researching phenomenon), so the students as well can form limited understanding. As researchers state, teacher's role in this respect is very significant. Research activity not only lays foundation for the later and deeper natural science subject learning, but this is an effective way for various cognitive ability development (Worth, 2010). However, earlier carried out research in Lithuania showed that teachers were apt more to demonstrate experiments (16.0%) than to encourage researching (1.8%). Researching, technology involvement are not dominating activities (Lamanauskas, 2005, 2018).

Thus, the main *aim* of this research was to analyse primary class teachers' position in scientific research activity sphere, i.e. how they value personal abilities to organise and carry out students' research activity, what limitations they discern, how they treat such activity importance and what improvement ways of this activity they discern.

Research methodology

General Characteristics

The research carried out was qualitative, of a limited amount. The research was carried out in the months January to February 2018. Before the research, participants' verbal agreement was obtained to participate in the research. The research is based on the attitude, that teachers' opinion and evaluation research are important due to the fact, that they allow establishing urgent problems and clarifying the already known issues, foreseeing not only natural science education improvement possibilities in a primary school, but are also important improving primary class teachers' preparation at university. From the point of view of methodological approach, this research is qualitative in nature (Marshall & Rossman, 2011).

Research Sample

Working primary class teachers from various Lithuanian primary schools participated in the research. In total 60 teachers from more than 25 schools took part in the research. Referring to methodological recommendations, from 25 to 100 respondents (or cases) should participate in a quantitative pilot research (Cooper & Schindler, 2014). In other researchers' opinion, the research being of not a big size, participating 10-30 respondents in the research, one can obtain useful and meaningful results (Isaac & Michael, 1995, p. 101). From all research participants, 40 respondents participated in the international programme "Apple friends" seminar. All respondents by gender are female. Research sample basically can be considered probabilistic. So, the attitude is hold, that such sample is sufficiently representative in a qualitative, limited amount research.

Conducting the research, the main research ethical rules were followed. Before the research, research aim, and objectives were explained to the participants, a verbal agreement to participate in the research was obtained. The participation in the research was completely voluntary.

Instrument

A prepared instrument was used in the research, in which five open questions/tasks were presented:

- Please, evaluate personal abilities to organise and carry out students' research activity in world cognition lessons?
- How do you think, what importance does students' scientific research activity organisation have for students' scientific research activity organisation in a primary school?
- What is necessary for the natural science research activity to become interesting and attractive for the students? Please, comment.
- How would it be possible to improve students' natural science researching and experimenting organisation in a primary school? Please, comment.
- What factors hinder/limit research activity development in a primary school?

Data Analysis

The research data were analysed applying a content analysis method. Understanding the meaning of the text is considered the main qualitative analysis principle. The data expressed in writing were analysed in three stages:

- multiple answer reading and analysis;
- semantically related answer and "key" word search and coding;
- semantic unit interpretation and co-ordination;
- subcategory and category system creation.

Content analysis was chosen, because this makes possibilities to give a sufficiently deep analysis of the data and to better understand unclear spheres and/or dimensions (Yıldırım & Şimşek, 2011). Also, it generates "words, rather than numbers, as data analysis" (Mack et al., 2005, p. 2).

To guarantee data analysis reliability, semantic unit distinction and later on grouping were carried out in two stages. In the first stage, two researchers carried out the analysis individually. In the second stage, the researchers were searching a consensus due to subcategory attaching to categories. The co-ordination degree was higher than 86 %.

So, first in the collected data array certain semantic units were distinguished, then their amount of frequency was calculated. For data and analysis (intermediate and final) presentation and rendering, the table format was chosen.

RESEARCH RESULTS

The analysis was carried out about how teachers value their ability to organise and carry out students' research activity. Results are presented in Table 1.

TABLE 1

Teachers' ability to organise and carry out students' research activity

Category	N (%)	Subcategory	N (%)	Subcategory components	N (%)
Ability level	72 (100)	Satisfactory abilities	41 (56.7)	Satisfactory abilities	13 (18.0)
				Trying to do one's best	11 (15.2)
				Good enough abilities	8 (11.0)
				Perform only very simple, not complicated experiments	5 (7.0)
				Additional support would be useful	4 (5.5)
		Average abilities	26 (36.3)	Abilities in SRA organisation are good	15 (21.0)
				Average abilities	4 (5.5)
				Abilities are normal	3 (4.2)
				Enough abilities	2 (2.8
				Able to point the students in the right direction	1 (1.4)
				Able to engage students in research activity	1 (1.4)
		Very good abilities	5 (7.0)	Have big experience	2 (2.8)
				Constantly renew the knowledge	2 (2.8)
				Very good abilities	1 (1.4)

Note: 72 semantic units were distinguished

The teachers' answers about their abilities to organise and carry out students' research activity in a primary school revealed three ability levels and allowed to formulate three subcategories: *Satisfactory abilities* (56.7%), *Average abilities* (36.3%), *Very good abilities* (7.0%). The biggest part of teachers (56.7%) valued their abilities to organise and carry out students' research activity as satisfactory. The teachers asserted that their abilities were only satisfactory, they were trying to do their best, performed only simple, not complicated experiments, additional support would be useful for them.

A part of the teachers (36.3%) valued their abilities to organise and carry out students' research activity in a primary school on average. They pointed out that their abilities in this activity were good or average, there was enough abilities to engage students in research activity and to point them in the right direction.

Only a small part of teachers (7.0%) indicated that their abilities to organise and carry out students' research activity in a primary school were very good: they had big experience, constantly renewed their knowledge.

Having analysed teachers' answers of how they value students' scientific research activity importance in a primary school, two categories were distinguished: *Education process improvement* and *Influence on the learner.* The results are presented in Table 2.

The first category *Education process improvement* (78.0%) was of great importance. It consisted of four subcategories: *Increasing teaching effectiveness* (33.3%), *Motivation formation* (22.5%), *Practical skill formation* (12.6%), *Lesson improvement* (9.6%). Mostly teachers noticed that students' scientific research activity organisation in a primary school *increased teaching effectiveness* (33.3%) and was an important sphere: knowledge and teaching material were better mastered, it helped to seek better learning results. The statements of a big part of teachers showed that students' scientific research activity organisation *formed motivation* (22.5%). Students were made interested, their learning motivation increased, students were made active, students' cognitive activeness increased. Scientific research activity *forms practical skills* (12.6%). Teachers marked that during scientific research activity students could observe, analyse, apply the obtained knowledge, interest in environment was developed. Scientific research activity organisation influences *lesson improvement* (9.6%): lessons become more interesting, diverse, learning attractiveness increases.

The second category *Influence on the learner* (18.1%) was of significantly less importance. It consisted of three subcategories*: Competence development* (13.5%), *Cognitive process development* (7.6%), *Sensuous cognition development* (0.9%). It is obvious that influence on the learners reveals through competence development (research work abilities are strengthened, planning abilities are encouraged, creativity is encouraged, has influence on children development), through cognitive process development (helps to better perceive the surrounding world, environment, critical thinking is encouraged, logical thinking is developed, develops image system creation) and through sensuous

TABLE 2

Students' scientific research activity importance in a primary school

Category	*N (%)*	*Subcategory*	*N (%)*	*Subcategory components*	*N (%)*
Education process improvement	79 (78.0)	Increasing teaching effectiveness	34 (33.3)	Better mastered knowledge	10 (9.8)
				Very important sphere	10 (9.8)
				Better mastered teaching material	8 (7.8)
				Helps to seek better learning results	6 (5.9)
		Motivation formation	22 (22.5)	Making students interested	11 (11.8)
				Increasing motivation to learn	5 (4.9)
				Making students active	3 (2.9)
				Increasing students' cognitive activeness	3 (2.9)
		Practical skill formation	13 (12.6)	Acquired knowledge is applied	6 (5.9)
				Students can observe, analyse	4 (3.9)
				Develop interest in environment	2 (1.9)
				Such activity teaches to learn	1 (0.9)
		Lesson improvement	10 (9.6)	Has positive meaning	4 (3.9)
				Lessons more interesting	3 (2.9)
				Makes lesson more diverse	2 (1.9)
				Increasing learning attractiveness	1 (0.9)
Influence on the learner	23 (18.1)	Competence development	14 (13.5)	Strengthened research work abilities	4 (3.9)
				Great use for the students	4 (3.9)
				Encouraged planning abilities	2 (1.9)
				Encouraged creativity	2 (1.9)
				Has influence on improvement	2 (1.9)
		Cognitive process development	8 (7.6)	Helps to better perceive surrounding world, environment	4 (3.9)
				Encouraged critical thinking	2 (1.9)
				Develops logical thinking	1 (0.9)
				Determines image system creation	1 (0.9)
		Sensuous cognition development	1 (0.9)	Enriches sensuous students' knowledge	1 (0.9)

Note: 102 semantic units were distinguished.

cognition development (enriches sensuous students' knowledge).

Having analysed teachers' answers what is necessary for the natural science activity to be interesting/ attractive for the students, three categories were distinguished: *Material supply*, *Teacher preparation*, *Teaching process improvement*. The results are presented in Table 3.

TABLE 3

Devices, making natural science research activity more interesting / attractive for the students

Category	N (%)	Subcategory	N (%)	Subcategory components	N (%)
Material supply	41 (48.8)	Teaching devices	36 (42.8)	Necessary appropriate devices, equipment	28 (33.3)
				Lack of devices	8 (9.5)
		Technological devices	3 (3.6)	Use more/ include ICT	2 (2.4)
				Necessary laboratory	1 (1.2)
		Financial resources	2 (2.4)	Necessary proper financing	2 (2.4)
Teacher preparation	25 (29.8)	Teacher's motivation	21 (25.0)	The teacher's himself/herself desire and initiative	12 (14.3)
				Teacher's efforts to involve students into the activity	5 (6.0)
				Appropriate teacher's preparation	4 (4.7)
		Teacher's activity encouragement	4 (4.8)	Interesting methodological material	3 (3.6)
				Positive school administration attitude	1 (1.2)
Teaching process improvement	18 (21.4)	Non-traditional environment	7 (8.3)	Suitable environment is necessary	6 (7.1)
				More lessons, activities in non-traditional environments	1 (1.2)
		Time allocation	7 (8.3)	Allot more time to SRA	7 (8.3)
		Practical activity	4 (4.8)	More practical activity	3 (3.6)
				More experiential teaching	1 (1.2)

Note: 84 semantic units were distinguished.

The first category *Material supply* (48.8%) revealed that the biggest part of pedagogues thought that that natural science activity would be interesting for the students, if there was a better supply of this activity with teaching devices (necessary appropriate devices, equipment), technological devices (to use more ICT, to have laboratories).

The second category *Teacher preparation* (29.8%) revealed that students' interest in natural science research activity determined teacher's motivation (desire and initiative, teacher's efforts to involve students into that activity, proper teacher's preparation). Teacher's activity encouragement is also important supplying the teacher with interesting, useful methodological material and positive school administration attitude to teacher's activity.

The third category *Teaching process improvement* (21.4%) revealed that natural science research activity would be interesting and attractive for the students if non-traditional teaching environments were created, more time was allotted for scientific research activity, practical activity.

Having analysed teachers' answers, how it would be possible to improve students' natural science researching and experimenting organisation in a primary school, two categories were formulated: *Supply improvement* and *Teaching process improvement.* The results are presented in Table 4.

Table 4

Students' natural science researching and experimenting organisation improvement in a primary school

Category	***N* (%)**	***Subcategory***	***N* (%)**	***Subcategory components***	***N* (%)**
Supply improvement	53 (75.8)	Laboratory creation	26 (37.3)	To equip specialized rooms / laboratories for primary class students	22 (31.6)
				To create mobile laboratories	4 (5.7)
		Device acquisition	20 (28.5)	To acquire necessary devices	15 (21.4)
				To allocate bigger financing	5 (7.1)
		Time allocation	7 (10,0)	To allot more time	7 (10.0)
Teaching process improvement	17 (24.2)	Non-traditional environment creation	15 (21.4)	More educational trips	6 (8.6)
				Possibilities to carry out education in various natural surroundings	4 (5.7)
				More practical activity	5 (7.1)
		Methodological device preparation	2 (2.8)	More methodological literature in researching /experimenting sphere	2 (2.8)

Note: 70 semantic units were distinguished.

The first category *Supply improvement* (75.8%) illustrates the opinion of a great majority of teachers, that seeking to improve students' natural science researching and experimenting organisation in a primary school, it is necessary to create laboratories (to equip specialised rooms and laboratories, to create mobile laboratories), to acquire more devices devoted for that and to allot for that activity more time at school.

The second category *Teaching process improvement* (24.2%) illustrates, that it is necessary to create non-traditional learning environments (more educational trips, to carry out education in various natural environments), to prepare methodological devices.

Having analysed teachers' answers about factors, limiting scientific research activity development in a primary school, three categories were formulated: *Supply limitations, Organisational limitations, Human limitations*. The results are presented in table 5.

TABLE 5

Scientific research activity development hindering factors in a primary school

Category	***N (%)***	***Subcategory***	***N (%)***	***Subcategory components***	***N (%)***
Supply limitations	37 (51.5)	Material factors	28 (39.0)	Lack of devices	25 (34.8)
				Lack of resources	3 (4.2)
		Financial factors	9 (12.5)	Lack of financing	9 (12.5)
Organisational limitations	24 (33.2)	Time factor	16 (22.2)	Shortage of time	16 (22.2)
		Programme factors	4 (5.5)	Complicated programme	4 (5.5)
		Students' number in the classroom	4 (5.5)	Too big number of students in the classroom	4 (5.5)
Human limitations	11(15.3)	Teacher's disinterest	11 (15.3)	Lack of teacher's initiative	6 (8.3)
				Lack of teacher's creativity	5 (7.0)

Note: 72 semantic units were distinguished.

The first category Supply limitations (51.5%) was of greatest importance. It turned out that teachers accentuated material factors (lack of devices and various resources) and financial factors, limiting scientific research activity development in a primary school.

The second according to its importance category Organisational limitations (33.2%), revealed that the main organisational factors, hindering to organise and develop scientific research activity in a primary school were lack of time, too complicated programme, too big students' number in classes.

The third category Human limitations (15.3%) revealed teachers' disinterest to develop scientific research activity in a primary school. Very often teachers lacked initiative, creativity.

Discussion

Learning at school is a diverse and very important process, influencing not only knowledge, ability and skill mastering, but also determining personality development. In order to properly organise and help children to learn, one must know, how the child's psyche, behaviour, activity change. In personality development process, the child's encouragement to cognise and explore (cognition through research or teaching process based on research) occupies an important place. Cognition process activeness is the essential factor of good learning. Therefore, it is very important to make perception, memory, thinking and imagination processes more active (Jovaiša, 2001). The child, involved into cognition process, is encouraged to observe, explore, analyse, generalise. The scientists assert that only an active student's cognition activity can have the biggest influence on personality development. Seeking to encourage the student's active cognition, various teaching strategies and methods, e.g., evidence-based teaching (Petty, 2009), problem-based learning (Maggi, 2000), critical thinking (Paul, Binker, Martin & Adamson, 1989) and other are presented today. All these teaching strategies (and methods) can be realised organising students' scientific research activity, where students raise problems, argue, critically think, search, perform various not complicated tests and/or experiments and so on. The conducted research showed that SRA had the greatest importance for teaching effectiveness increase (33.3%) and motivation formation (22.5%). A very important aspect is motivation. The research conducted in Qatar showed that this aspect was also considered as one of the most important (Said, Friesen & Al-Ezzah, 2014). Besides, research component inclusion into teaching/learning process makes it more enjoyable and relevant (Suduc, Bizoi & Gorghiu, 2015), develops interest in natural sciences in general (Andersen & Vandehey, 2012).

The teacher, tending to more frequently organise students' reproductive activity, can reach necessary results, however the thing that students mastered the prepared information and acquired abilities and skills does not mean, that they mastered creative, problem solving, research experience. Learning only according to an example, the student does not acquire independent learning, searching skills. Research activity, as this research showed, simultaneously strengthens practical abilities as well, has influence on internal motivation. This correlates with the earlier research, showing, that practical experiments/tests encourage students' learning, strengthen their internal motivation (Dhanapal & Wan Zi Shan, 2014). We could get a significantly bigger effect having created a situation, in which a student will feel uncertainty and doubts and various questions

will emerge, than explaining everything and teaching according to an example. Such a situation is easily created at the time of research, in which possibilities are formed to develop students' ability to solve problems, critically think, make insights, creatively act, develop personality features. Organising students' research activity, preconditions are formed for the students to actively and independently act. Working in this way, students learn to explore, to perceive a problem, to formulate aims and tasks, to raise a hypothesis, to form its checking plan, to analyse research results, to check the obtained results' reliability, if necessary to raise a new problem and so on. In other words, the students master scientific cognition elements. Teacher's role in this context is special. The conducted research showed that teachers' ability to organise and carry out students' SRA was insufficient. Even 56.7% of respondents evaluated the abilities in this sphere only as satisfactory. As researchers emphasise, scientific research activity abilities (or in other words, teacher as researcher competence) should not be considered as a separate subject, but as a constant and inseparable part of teachers' professional mastery (Evans, Waring, & Christodoulou, 2017). So, the question of how to become more research active, basically remains open for deeper and more exhaustive research and for teacher preparation or qualification raising practices grounded on their basis.

Conclusions and implications

Research results revealed that teachers' ability to organise and carry out students' research activity in a primary school was valued in three levels. The biggest part of teachers, to organise their abilities and carry out students' research activity valued only as satisfactory. A third of the teachers thought that these abilities were average. Only a small part of teachers valued their abilities as very good.

A very big part of the teachers think that SRA is significant for the education process improvement: teaching effectiveness is getting better, students' motivation is formed, students acquire practical skills, the lesson is improving, collaboration is developed. Most of the teachers think that scientific research activity has a big influence on primary school students: various competences are educated and developed, students' cognitive processes are educated, sensuous cognition is developed.

Most of the teachers think that better material and financial supply of this activity is necessary. Appropriate teacher preparation to organise students' scientific research activity in a primary school is treated as a very important thing. This is associated not only with teaching process improvement in general, but with non-traditional teaching/learning environment creation, better time planning, SRA methodology preparation and so on.

Research results revealed that a very big part of teachers thought that seeking to improve students' natural science researching and experimenting organisation

in a primary school, it was necessary to improve this activity supply with devices, laboratories, to allot more time. A part of the teachers thought that it was necessary to improve teaching process in general.

Research results allowed stating the factors hindering scientific research activity development in a primary school. The main factor hindering scientific research activity development in a primary was supply limitations, related with material and financial difficulties. The other factors, hindering scientific research activity development in a primary school, were organisational (lack of time and education programme complexity) and human factors (lack of teacher's initiative, creativity, lack of competence).

Primary school teachers positively evaluate the significance of scientific research activities for the improvement of the educational process and the development of learner competencies, the development of cognitive processes, however, they reveals many disadvantages associated with the organization of this activity. It is necessary to improve the curriculum and teaching/learning content for primary schools by providing more time for students being involved in science (scientific, practical) research. It is very important to encourage teachers to improve the learning process by creating a variety of unconventional (non-traditional) learning environments that encourage students to explore, to experience the joy of discovery. This requires better provision of primary schools with appropriate research tools (instruments, equipment etc.). Primary school teachers need permanent didactic/technological support.

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