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# Pupils with Special Educational Needs Facilities of Natural Sciences Motivation Education

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**Abstract.** The article considers the possibilities of motivation education for pupils with special educational needs while studying the subject of natural cognition. As the Ministry of Education, Science and Sport of the Republic of Lithuania states, the majority of pupils with special educational needs are educated at general education schools together with their peers through inclusive education. STEM method is best suited for pupils with special educational needs due to the integration of the pupils in the curriculum with the whole class, allowing them to choose tasks. In order to highlight how to strengthen the learning motivation of pupils with special educational needs, qualitative research is chosen. During the qualitative research, a structured interview is conducted, the data of which is processed by the content analysis method. The study included 7 pupils with special educational needs. Interviewed pupils indicate, that their learning motivation is influenced by good relationships a pupil – a pupil, a teacher – a pupils, a parent – a pupil; possibilities to work in a group; variety of learning environment (e.g. outdoor class); discussion of successes and failures, highlighting progress.

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**Keywords:** *pupils with special education needs; natural science education, STEM, motivation.*

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## Introduction

The curricula of general education schools is calling to take account of pupils' inclinations, content of education, process, forms and ways of education (Galkienė, 2013). Wornald, Rogers, & Vialle (2015) state, that individual pupil education plans must take into account the pupil's abilities, to ensure school support, considering pupil's disabilities. Their researches shows that pupils are able to evaluate the strengths that they can use in the learning process and hope that education will be based on their strengths.

“Learning is the main pupils’ activity and motivation is the process which encourage the pupil to behave in a way that achieves the goals” (Pečiuliauskienė, & Damauskienė, 2013, p. 111). Teaching motivation is one of the important factors determining the effectiveness of the educational process. This encourages pupils to achieve goals, use information processing strategies and skills. The presence of motivation helps the pupil to participate actively in education. Giedrienė (2015) says that most children with special educational needs are willing to go to school, but after learning difficulties, various failures they lose their willingness to study and attend school. In the opinion of the researcher, these problems are usually caused by peer bullying, by too difficult tests, by stricter teacher requirements for children (Giedrienė, 2015).

Pupils with special educational needs have less intellectual abilities, their pace of work is slower, they have lack of curiosity or motivation for cognition. These pupils can achieve their goals and the teacher should support the learner’s efforts to achieve the goal. Teachers have many opportunities: foremost to personalize the teaching process, to work well with motivation, to promote self-confidence, to work with parents to solve specific problems.

Researchers have found that in general education, from primary school through to gymnasium, excellent STEM results can be achieved, but this requires special efforts (National Research Council, 2011). Modern school education should focus on the effective organization of the learning process. It is clear that teachers need to focus their efforts to improve the organization of student education, to create the necessary conditions that could solve this problem.

In psychology, learning motivation is described as a process of behavior, process for actions’ motivation, and action motivated by various motives (Myers, 2008). There are two types of motivation for learning: internal and external, which have big importance for learning. There are two types of motivation for learning: internal and external, which are of great importance for learning. According to Robinson (2012), the motivation of pupils can be raised by adapting and personalizing general education programs. The author calls attention to the human’s ecological concept, based on diversity. In the context of motivation, this means supporting different learning styles with respect to intellectual abilities. In this way there occurs the opportunity to highlight pupil’s strengths and possibilities about which the pupils with special educational needs are unaware or understand them hardly. According to Bobula (2013), self-awareness, aware of their strengths and limitations, and education in a heterogeneous environment for pupils with special educational needs are the appropriate tools to ensure their learning motivation. Many European countries, including Lithuania, have reduced pupils’ interest in studies related to natural sciences and mathematics, therefore, the development of pupils’ motivation for natural science learning is a very relevant issue (Pečiuliauskienė, 2018).

*Research object:* Possibilities for motivation development of pupils with special education needs while studying the subject of natural knowledge.

*Research goal:* To reveal the possibilities of motivation development for pupils with special education needs while studying the subject of nature sciences.

*Research tasks:* 1. To highlight theoretical possibilities of motivation of pupils with special educational needs to learn the subject of nature education.

2. Identify the learning factors of children with special educational needs.

## Research methodology

Analysis of scientific pedagogical and psychological literature sources and educational documents. During the qualitative research, a structured interview is conducted, the data of which is processed by the content analysis method. The interview was conducted by recording the most important insights during the interview. Immediately after the interview, the content of the interview was restored and an interview report was written. Interview questions were made for the purpose of the intended investigation. The content analysis method provides the ability to identify the relationships between texts, meanings, themes, and analyze them in the selected field of research, that is, the data were generalized and interpreted. “Qualitative content analysis enables us to describe phenomena and interactions based on unique people experiences. This analysis aims to discuss the phenomenon in a comprehensive and systematic way” (Žydžiūnaitė, & Sabaliauskas, 2017). Using this data analysis method, the information obtained by the content and meaning was categorized into sub-categories and categories, and empirical data-based conclusions were formulated. One of the key tasks was to select a sample of the study, as it depends on the characteristics of the study and the quality of the study. Pupils with special educational needs from the general education school in Vilnius were selected. 7 respondents agreed to participate in the study from the city school. Respondents participated in the study voluntarily, they and their parents (guardians, caretakers) were informed about the purpose of the investigation, observance of the ethical principles of the research, written consent for participation in the interview. Respondents were informed that the confidentiality and anonymity of the information provider would be ensured.

## Theoretical justification

The Law on Education of the Republic of Lithuania states that “the purpose of the education of pupils with special educational needs is to help the pupil to learn, to acquire skills, to acquire education and qualifications, to recognize and develop their abilities and powers” (Lietuvos Respublikos Švietimo įstatymas, 2011). Educators must provide basic knowledge for pupils with medium or large special educational needs and basic knowledge for pupils with large or very special educational needs, and develop in different educational institutions according to the same curriculum, tailor-made curricula.

Special educational educators "...have those who find it difficult to learn because of their learning needs. The concept of Special educational needs defines learning difficulties which pupil experience while he is learning or trying to reach the same goals as other peers, requiring additional help" (The Department for Children, Schools and Families, 2010).

The aim is to know as good as it is possible learners with special needs, to take into account their abilities, peculiarities of each of them, educate using the strengths of the pupils and compensate for the shortcomings (Kielaitė, 2013). General education schools is provided at the conditions, which parents (caretakers) and pupils require pupils' integrated and inclusive education take place, although experiences different difficulties. When organizing training for pupils with special needs, it is important to take into account their individual pace, attention and other characteristics. We need to strive for an optimum quality of training that will enable every pupil to be educated at the child's level.

Some authors Ališauskas (2011) (Morrison, & Cosden, 1997; Wong, Graham et al., 2004; Waber, 2010; Scanlon, 2013) emphasize the creation of a supportive learning environment, a flexible learning process, and the recognition of mistakes in achieving good educational achievement for pupils with special educational needs.

The benefits and relevance of STEM education are obvious to many today. When implementing the STEM program, the curriculum should be designed with the special educational needs of pupils in mind. One of the principles of STEM education, expressed in 2014. At the International STEAM Forward Conference in Jerusalem, "Science Is Fun!". Science should be a celebration for students, it should be fun and fascinating for students.

Educating pupils with special educational needs at the general education school requires a lot of effort, teacher knowledge, skills, this process is complicated. Teachers encounter many problems in organizing the educational process in heterogeneous groups of pupils (Mažylienė, 2011). The inclusive process must ensure that each pupil has a quality education in which the teacher and the school staff must take into account the abilities and needs of each student (UNESCO, 2009). Recent studies show that one of the key elements for successful learning is increasing motivation. "Motivation is the stimulation and promotion of action and behavior in the human psyche. It includes human needs, desires, interests and inclinations, values, attitudes and beliefs. Learning motivation helps the learner to focus on the goal, to understand how long it will take to reach the goal, whether it will need reinforcement and what it is, actualizes the learner's knowledge, abilities and skills, awakens his / her sensitivity to external help, influences the quality of learning, results and learner's personal progress" (Targamadžė, Girdzijauskienė, Šimelionienė, Pečiuliauskienė, & Nauckūnaitė, 2015). Pečiuliauskienė, Damauskienė (2013) point out that motivation is an integral part of success in encouraging learning. The reason for successful learning: "Practical benefits - I learn because it is useful for me, I can practice what I learn in a lesson; Future Perspective

- I want to prepare for a career or further studies; self-esteem - good learning results show that I can do that; learning for others - if I do well, I will get to the teacher and / or classmates. If I do not learn, I will have trouble; human interest - what I learn is interesting to me and satisfies my expectations. It's fun to learn. Learning motivation is definitely an important factor in learning outcomes. Learning is a key activity for students, and motivation is a process that encourages pupils to behave in a way that achieves goals“ (Pečiuliauskienė, & Damauskienė, 2013).

To sum up, a variety of methods, tools, the ability to experiment and organize activities in an unusual learning location are factors that particularly contribute to the motivation of learners with special educational needs. Learning motivation helps pupils to target their goals, allows them to understand the need for help, and the teacher is the person who brings up the necessary knowledge, skills and abilities of the learner, encourages to ask, ask for help. All factors influence the quality of learning, the results, the willingness to learn and seek progress.

## Research results and their analysis

The willingness to learn is an important educational value that influences the motivation of pupils to learn. Therefore, the motives of educational opportunities to learn about nature learning and education were explored at work. In order to learn about the attitudes of pupils with special educational needs to learning, the question was asked in an individual survey “My desire to learn depends on ...”. The data obtained were analyzed, categorized and sub-categories based on evidence (Table 1).

Table 1

*Motives to encourage pupils with special educational needs activities*

Category	Subcategory	Evidential claims
Motivation to work in an interesting environment	Interesting lessons	2R <...> the lesson must be fun and interesting then I like to learn. 5R <...> from the teacher, whether she leads us somewhere outside...
Experience of success	Good evaluation of achievements	3R <...> this is the marks. 1R <... > from good grades. 5R <...> good grades.
Behavior of friends as motivation for action	Communicating with friends	3R <...> a lot of friends. 6R <...> from friends.
Behavior of parents as motivation for action	Communicating with parents	7R <...> from parents.
Behavior of teacher as motivation for action	Communication with teachers	4R <...> from teacher. 7R <...> from teacher.

Factors motivating pupils with special educational needs. Five qualitative categories have been identified (Fig. 1): 1) motivation to work in an interesting environment; 2) success experience; 3) behavior of friends as motivation for action; 4) parental behavior as motivation for action; 5) Teacher's behavior as motivation for action.



Figure 1. Motives to encourage pupils with special educational needs activities

Four qualitative subcategories have been identified (Fig. 2): 1) dislikes to learn; 2) excessive learning load; 3) boring lessons; 4) experience of failure.

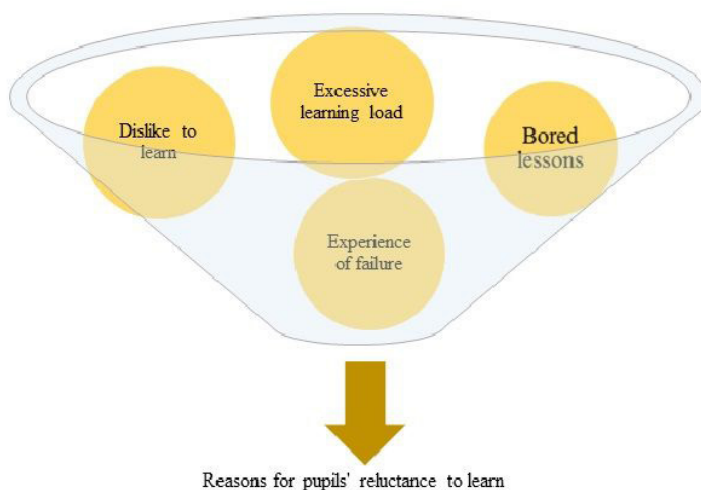


Figure 2. Reasons for pupils' reluctance to learn

Pupils with special educational needs indicate that they do not like learning (Table 2). They don't to learn, because lessons aren't interesting, learning is overloaded and failures are often experienced. From researchers participants stories we can understand, that there are many reasons why pupils don't want to learn. It is important to find out in a timely manner and help pupils to regain their willingness to learn. The study of motivation opportunities for pupils with special educational needs sought to find out how pupils behave when the task is too heavy or does not understand the topic that the pupils are doing when faced with learning problems. It appeared that they are looking for help. Research data suggest that most pupils are able to find ways to overcome learning difficulties.

Table 2  
*Reasons for pupils' reluctance to learn*

Category	Subcategory	Evidential claims
Reasons for pupils' reluctance to learn	Dislike to learn	5R I don't succeed in learning. 6R I don't like to learn. 2R <...> I like it not so much. 4R <...> I don't like.
	Excessive learning load	3R <...> I try to do <...> sometimes I'm not doing because I don't know how to do it. 1R I try to do what I know. 4R <...> I do, sometimes lazy or I am not in a time.
	Bored lessons	2R <...> show movies and go outside. 3R <...> show movies, <...> to allow to play. 6R <...> different games. 1R <...> to do interesting tests <...> movies.
	Experience of failure	4R <...> I don't always experience success on lessons. 1R <...> not always can say, that always.

Ways for pupils with special educational needs to overcome learning difficulties. Four qualitative categories have been identified (Fig. 3): 1) the influence of teachers on motivation; 2) motivation for the activities of classmates; 3) the influence of parents on motivation; 4) the influence of teachers' behavior on motivation.



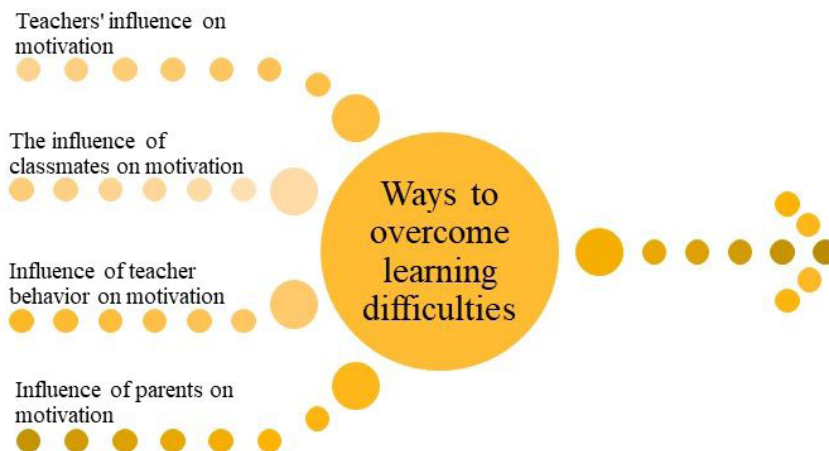


Figure 3. Ways to overcome learning difficulties

While researching pupils with special needs learning motivation opportunities it was necessary to find out about their learning environment (Table 3). Good relationships between pupils and teachers, pupils and classmates at school encourage pupils' willingness to learn and positively affect learning outcomes and progress. Most like working with peers. Teachers help and hear pupils with special educational needs.

Table 3

*Ways to overcome learning difficulties*

Category	Subcategory	Evidential claims
Teachers' influence on motivation	Teacher's help	1R the teacher will always help if needed. 5R devote enough time for everyone. 3R sometimes teacher helps me if I don't know something. Teacher often helps me. 6R <...> always helps me and explains what is my mistake. 7R <...> I'm trying to do it <...> if something fails, I am asking.
	Feedback	1R <...> I am thinking how to write better next time. 4R I am thinking if I could fix it. 6R When a teacher returns my job I look at it and try to correct my mistakes in another job.



Category	Subcategory	Evidential claims
The influence of classmates on motivation	Inclusion in joint activities	4R <...> I like to work in pairs. 7R <...> while working in group I learn more than working by myself. 1R <...> because I can ask that they explain. 6R <...> working in group I get more information.
Influence of parents on motivation	Parents' help	1R They help if I need it. 7R if something goes wrong I ask father to help and he explain how to do the task
Influence of teacher behavior on motivation	Application of teacher ethics principles	2R <...> don't scream. 7R <...> don't scream at me.

Pupils with special educational needs positive emotional experience. Three qualitative categories have been identified (Fig. 4): 1) experienced victory; 2) good evaluation; 3) learning environment.



Figure 4. Experience of positive emotions

Honors and good achievements are very important for pupils (Table 4). All this is satisfied by their need for recognition. Being recognized is one of the most important needs for pupils. Good evaluation and recognition have a positive impact on their self-esteem.

Table 4

*Experience of positive emotions*

<b>Category</b>	<b>Subcategory</b>	<b>Evidential claims</b>
Experienced victory	Honors, encouragement	7R <...> when I get the mark, everyone is happy.
Good evaluation	Experience of success	4R <...> when praise then I am very pleased. 5R<...> I go home successful.
Learning environment	Classroom atmosphere	4R <...> we like to joke friendly. 7R <...> I feel like at home in my classroom. 6R in class I have a lot of friends. 5R my classmates are friendly.

The pupils surveyed indicate that their learning motivation is influenced by: a more diverse learning environment (e.g., outdoor class), experiments, group work. Appropriate assessment, discussion of successes and failures with emphasis on progress is important for pupils with special educational needs. According to the pupils, their willingness to learn is promoted by good interrelationship between pupils, teachers and pupils, and between pupils and parents.

## Conclusions

Opportunities to develop the scientific motivation of pupils with special educational needs become evident when 1) the learning process is organized according to the opportunities of the pupils; 2) good relations between all participants in the education process prevail.

The motives are external or internal factors that promote the activity of the individual and determine the direction of his activity, and the motivation is the system of motives that initiate and support the direction of activity.

In order to create a supportive educational environment for pupils with special educational needs and want to increase their willingness to learn, the teacher needs the knowledge, skills and personal qualities of communication with such pupils (forgiveness, attentiveness, patience, diplomacy, ability to listen, understanding, negative emotion management; positive attitudes towards teaching children with SEN, and follow the code of ethics for teachers).

The motivation for learning by SEN pupils is determined by their self-confidence. The internal and external motivation of pupils' learning is strengthened by taking into account their cognitive, self-expression, future perspectives, communication and recognition needs.

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# Specialiųjų ugdymosi poreikių turinčių mokinių gamtamokslinės motyvacijos ugdymo(si) galimybės: mokinių požiūris

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## Santrauka

Straipsnyje nagrinėjamos mokinių, turinčių specialiųjų ugdymosi poreikių, motyvacijos ugdymo(si) galimybės, jiems mokantis gamtos pažinimo dalyko. STEM metodai geriausiai tinka specialiųjų ugdymosi poreikių mokiniams dėl to, kad mokiniai integruojami į ugdymą su visos klasės mokiniais, leidžiant jiems rinktis užduotis. Šių pamokų metu mokiniai patiria teigiamų emocijų, geba vizualiai įvertinti savo veiklos prasmingumą. Siekiant išryškinti, kaip stiprinti specialiųjų ugdymosi poreikių turinčių mokinių gamtamokslinę mokymosi motyvaciją, pasirinktas kokybinis tyrimas. Kokybinio tyrimo metu vykdomas struktūrizuotas interviu, kurio duomenys apdoroti turinio analizės metodu. Tyrime dalyvavo 7 mokiniai, turintys specialiųjų ugdymosi poreikių. Apklausti mokiniai nurodo, kad jų mokymosi motyvacijai turi įtakos geri tarpusavio santykiai: mokinys – mokinys, mokytojas – mokinys, tėvai – mokinys; darbas grupėmis; kita mokymosi aplinka (pvz., lauko klasė); eksperimentai; sėkmių ir nesėkmių aptarimas, akcentuojant daromą pažangą; svarbus yra teisingas vertinimas.

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**Esminiai žodžiai:** *mokiniai, turintys specialiųjų ugdymosi poreikių (SUP); gamtamokslinis ugdymas; STEM; motyvacija.*

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