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CULTIVATING IMAGINATION IN EDUCATION PROCESS: CONTEXT OF PRIMARY TEACHERS' OPINIONS

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Abstract. *The importance of imagination in the process of education is unquestionable - by developing the ability to create and retain images, sounds, feelings as a reflection of one's thoughts, the basis of thinking is constructed. All this helps students to discover and create something completely new, solve problems, move to other spaces, understand others.*
The article theoretically substantiates the importance of developing children's imagination and empirically reveals the opinion of primary school teachers about the aspects of developing imagination and visualization skills in the educational process.
The written questionnaire study was carried out in January – July of 2020. The study involved 390 primary school teachers which shows the validity of the data and reflects the opinion of the majority of Lithuanian primary school teachers in the context of the analysed object. The data were processed using descriptive statistics (frequency) and analytical statistics (Mann Whitney U Test).
The results of the research reveal that the imagination of primary school students is usually developed through fairy tales, character role plays, and in language teaching subjects, images are usually conveyed through verbal codes. In Maths, language teaching and Science lessons, students usually depict fantastic objects, diagrams, tables and charts, draw folk symbols, and produce visual instruments.
Keywords: *cultivating imagination; Lithuania; primary education; teachers' opinion.*

Introduction

The research data reveal the value of imagination as a prerequisite for innovation and problem solving. As it is noted by Sandri (2013), imagination in the learning process is the basis for the integration of experience, when the boundaries between facts, reality and meaning are eliminated. It is the imagination that expands and deepens the human experience, as ordinary and familiar objects of the environment are coloured with different colours. The importance of imagination is actualized in the process of teaching Science, researches and projects (Andre´e & Lager-Nyqvist, 2013; Siry & Kremer, 2011), in which the development of new ideas through collaboration is important. The role of imagination in the formation of children's decision-making is also revealed (Mackey, 2012). The results of research by Caiman & Lundegard (2018) reveal

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the role of imagination in the processes of meaning-making and learning in the context of primary education, where children are given the opportunity to be both students and experts.

In order to develop children's imagination, it is important what opportunities to promote children's new ideas teachers have (van Alphen, 2011; Vecchi, 2010; Young & Annisette, 2009; Roy, 2005; Greene, 1995). Therefore, it is necessary to promote the development of children's senses, imagination in the classes of various educational subjects, because this is what contributes to innovative change. Many scientists emphasize that "techniques and activities that enable the development of creative imagination should be applied to individuals from an early age" (Gündoğan, 2019; Jankowska & Karwowski, 2015; Karwowski & Soszynski, 2008; Craft, 2002).

The research problem is based on the theoretical assumption that children from an early age have a volatile imagination and innate creativity, but in today's age of technology, with the influence of external factors that suppress the imagination of the modern generation of children, these qualities weaken. In the process of education, it is important to create conditions for enriching and developing children's imagination in various ways.

The research aims to reveal the opinion of primary school teachers about the aspects of development of imagination and visualization skills in the educational process.

Theoretical Basis of the Study

Today's education is based on the idea of an individual, free-thinking development, which is realized by specialists in their field – practitioners who implement the aspirations of curricula. This idea is based on free expression of students' thoughts, which is achieved through the cultivation of imagination. Namely, imagination is used to generate new ideas, "establishing unusual and new connections, and investigating different possibilities" (Duffy, 2006). As noted by Craft (2002), children are characterized by inborn "curiosity, imagination and creativity abilities and this type of creativity is called as little creativity".

The multidimensionality of the concept of imagination is based on the view that "it is virtually impossible to provide one unambiguous and uncontested definition for imagination" (Bailin, 2007). The analysis of various scientific sources (Table 1) revealed that the concept of imagination is associated with creativity (McKernan, 2008), educational purposes (Eisner, 2018), the ability to perceive different things (Warnock, 1976). Egan & Judson (2016) describes imagination as an ability to enrich thinking, generate new ideas, and contribute to successful learning. Thus, imagination promotes the active process of thinking through educational imagination-shaped experiences.

The cultivation of imagination is one of the educational objectives (Egan, 2005), where students are interested in educational content, fully expressing internal needs. According to McKernan (2008), "a curriculum must provide opportunities for students to think critically and freely for themselves. Given that curricula emerge from images of desired and ideal practices we need to introduce another powerful concept, often neglected in education, and that is the concept of imagination".

Table 1 ***The Analysis of Imagination Definitions*** *(composed by the authors on the basis of Eisner, 2018, Egan & Judson, 2016, McKernan, 2008, etc.)*

Statements	Source
"Imagination is central to the educated mind. It permits the possibility of the creative".	McKernan, 2008
"The concept of imagination is crucial to the purposes of education".	Eisner, 2018
It "is the faculty by means of which one is able to envisage things as they are not".	Warnock, 1973
"Imagination is the capacity to think of things as possibly being so; it is the source of invention, novelty, and generativity; it is not distinct from rationality but is rather a capacity that greatly enriches rational thinking; and it has an equal role in successfully learning academic subjects as engaging in arts activities".	Egan & Judson, 2016
"Imagination is the ability to visualise something that does not exist at that moment".	Gündoğan, 2019
"The ability to think of things as possible – the source of flexibility and originality in human thinking".	Egan, 2005
"Imagination is the ability to picture something in the mind that bears a relationship to a phenomenon from the physical world or other human experience such as the psychological, mythical, spiritual or philosophical".	Steiner, 1996

Imagination is one of the tools used by teachers to develop children's knowledge, skills and abilities. However, to cultivate the curiosity and motivation of children, all activities of educational institutions must be focused on the justification of the educational content by imagination, and not on individual cases of imagination cultivation in teaching and learning processes. This would further enhance the effectiveness of education and student learning. As it is emphasised by Marsh & Willis (2007) "curriculum developers have usually approached design from one of three perspectives: the nature of subject knowledge; the nature of society; or the nature of the learner".

The application of stimulating environments in educational institutions, and in the educational process, various techniques, educational opportunities are expanded, children's imagination is developed, which is not suppressed by any factors of reality. Teachers, by applying various techniques in lessons, can

stimulate the imagination of the students and encourage more effective learning. One example of such techniques is given by Gündoğan (2019) – "SCAMPE, an imaginary activity that helps to produce many ideas in make-believe world. It is composed of a series of questions stimulating and activating the individual to produce creative ideas". Creativity is inseparable from imagination. Scientific literature uses the term creative imagination, which is described as "ability to rearrange and manipulate existing information and convert it into unique and original mental images" (Eberle, 2008; Lindqvist, 2003). As Egan & Judson (2016) note, using imagination in the educational process "can make teaching and learning more interesting, attractive and diverse." Teachers, in order to stimulate the imagination of children, "not only consider the curricular content and concepts they are dealing with, but also think about the emotions, images, stories, metaphors, sense of wonder, heroic narratives, and other cognitive tools that can give these concepts and content life and energy" (Egan & Judson, 2016). In summary of the insights of the researchers, it can be said that imagination is the key to overcoming and engaging all participants of the educational process in active learning.

Research Methodology

The quantitative research method chosen is a written questionnaire. The research instrument (questionnaire) was developed by the authors of the research on the basis of the analysed literature, the results of exploratory study and consultations with primary school teachers. The instrument was first developed in spring of 2019 and consisted of open-ended questions. In the initial survey, 45 primary school teachers were interviewed (25 questionnaires were not returned). The exploratory study revealed that the pedagogical community has a negative attitude towards the open-ended questions of the questionnaire, as it takes a long time to answer them. Many of the responses received were completely unsuitable for data analysis. Based on this experience, a broader research instrument, a close-ended questionnaire, was constructed. In 2020, the reconstructed instrument was piloted again with several respondents in order to provide clear and comprehensible statements, reduce the time to complete the questionnaire, and increase the internal validity of the questionnaire. Duplicate questions were eliminated during the pilot tests. The questionnaire consisted of five scales (significance of the use of imaginative tools, areas of education that focus on imagination, application of imaginative tools, development of imagination through active physical activity) and 12 subscales, 67 questions. Within the limits of this article, the most significant part of the questionnaire corresponding to the subject of the article research is reviewed.

Almost all scales of the questionnaire have a fairly high internal reliability – Cronbach's alpha is higher than 0.75, but when applying the questionnaire to

compare large groups of respondents (if N>100), the alpha coefficient may be lower than 0.7 (Vaitkevičius & Saudargienė, 2006), since the scope of the study is large, it is assumed that the survey questions are suitable to measure the subject and are valid for obtaining relevant conclusions.

The study was carried out in January – July of 2020. The study involved 390 primary school teachers which shows the validity of the data and reflects the opinion of the majority of Lithuanian primary school teachers in the context of the analysed object. 400 questionnaires were distributed, 10 of which were rejected because not all questionnaires were completed. 59% of respondents were primary school teachers working in the city, 41% were primary school teachers working in the district. The feedback rate for the suitable paper questionnaires was 88%. 97.9% of all respondents were women, 2.1% were men. The majority of senior teachers (59%) were involved in the survey, 30.8% were teachers who were methodologists, and 10.3% were teachers who did not have a higher qualification. 11% of all participating teachers work as primary class teachers up to 10 years, 38.7% - up to 20 years, 33.8% - up to 30 years, 16.4% - about 40 years. Most teachers (72.5% of all respondents) have worked for more than ten years and less than 30 years, which means that the respondents have sufficient work experience, so the survey data should be reliable.

The data were processed using descriptive statistics (frequency) and analytical statistics (Mann Whitney U Test). The Cronbach alpha coefficient was used to determine the internal validation of the scale, and the Kolmogorov-Smirnov Z test was used to determine the normality of the variables. The data was described using the PI (Popularity Index), which shows the ranking of the most popular answers. It is calculated by subtracting the lowest (frequency obtained from answers) percentage frequency from the highest. In this case the calculation formula is as follows (5-1) = PI (Bitinas, 2002). Analytical statistics was used to analyse empirical data based on analytical methods (Pukėnas, 2005). The Kolmogorov-Smirnov Z test was applied to the normality of variable distributions, which showed which variables can be measured by parametric or non-parametric methods. The results of Kolmogorov-Smirnov Z test show that all variables are distant from the normal distribution ($p<0.05$), and the Mann Whitney test and Kendall's Tau-b correlation are used in the empirical part.

Research Results. Imagination development and visualisation activities in district and city primary classes rank analysis

The analysis of the research data on imagination development activities (Table 2) revealed that, according to the popularity index of imaginary objects, the greatest importance is given to imaginative development in the process of language teaching, when pedagogues ask to imagine literary characters (PI=61.6). This shows that teachers strive for a better student understanding of literary works,

the characters and the text being read. Literary text encodes visual information into verbal codes. Students, when reading the text, have to decode these codes and imagine the whole course of events or described objects in their minds. In literature lessons, unlike in natural science disciplines, objects are perceived more subjectively. The latter objects cannot be visualized unambiguously, so there are no templates, specific images that could be displayed when reading the text. The more often children imagine literary characters, the easier it is to understand the text, the characters, to form an assessment, and to develop critical thinking.

The second place, according to the popularity index of imaginary objects, falls to the visualisation of a task read in Maths. Teachers often ask students to imagine the assignment being read so that students will have a better understanding of the content of the lesson, understand what needs to be found and apply the knowledge they have. Internal visualization actions help students understand the existing and missing elements of a task, form objects in the imagination, and solve the task faster. Mathematical education is in third place in the rankings. It is the performance of mathematical actions by heart (PI = 32) where students imagine the processes of subtraction or addition, multiplication or division. As practitioners, teachers apply those methods and techniques that are most effective in teaching students. Activation of visual thinking by encouraging students to imagine literary characters, the conditions of the task they read, and mathematical actions helps them to master the concepts of disciplines more quickly, to understand information encoded in verbal and static codes, and to perform the necessary learning actions.

Table 2 ***Imagination development visualisation activity ratings*** *(composed by the authors)*

ACTIVITY	PI
Students are asked to imagine:	
Literary characters	61.6
The task they read	42
Arithmetical calculations (imagine numbers in mind, then subtract, etc.)	32
Life problems, their solutions	18.7
Different diagrams in Maths lessons	16.4
Different mathematical symbols	14.7
Nature images (hills, meadows, lakes, etc.)	13.6
Spatial figures in Maths lessons	10
Different drawings in Maths lessons	9.5
Historical events	2.2

District teachers are more likely to ask their students to imagine literary characters (average rank 215.77) than city teachers (average rank 181.40); Z statistics $\int Z \int = -3{,}312$, and its p-value $p = 0.001$, i.e. $p\ \delta < 0.05$. District teachers

spend more time imagining literary characters than city teachers as can be seen from the survey data.

Correlation calculations revealed that there is a statistically significant (p=0,000) however, weak (r=0.358, i.e. r>0.3<0.5) relationship between teachers' request for students to imagine arithmetic actions in their minds and to imagine literary characters. This may mean that those primary school teachers who tend to activate the inner imagination by visualising mathematical actions also use this method in language teaching. The lowest positions in the rankings are the imagination of spatial figures (PI = 10) and the visualisation of various schemes (PI = 9.5) in Maths lessons. This implies that in practice these activities are not very valid and are therefore not given priority. At the bottom of the ranking table is the development of visual thinking in imagining historical events (PI = 2.2) - teachers almost never ask students to visualize images related to historical events.

Primary school teachers usually develop the imagination (Table 3) of their students through fairy-tales. Such results are caused by after-school activities, when teachers strive for students to develop various competencies through the staging of fairy tales. Fairy tales help students to imagine various problematic and educational situations. The second place in the rankings is taken by the role play of literary characters. Primary school students develop their imagination by role playing literary characters (PI = 48.7). The development of imagination through acting is focused on demonstration activities for parents and teachers, the aim is for students to understand the literary works presented in their school curricula, the characters.

Table 3 ***Ratings of imagination development by role playing activities***
(composed by the authors)

ACTIVITY	PI
Students are asked to act out:	
Fairy tales	51.2
Literary characters	48.7
Life situations	40
Animals or plants	23.3
Various items	17.1
Riddles	14.1
Song text	12.8
Fantastic objects	7.2

According to the popularity index, the third place is given to the visualisation of life situations (PI=40). The fourth is taken by imaging animals and plants (PI=23.3). Teachers still develop the imaginations of students by focusing on the compassion of lower-conscious animals so that people can be understood later. Animal role playing is characteristic of the activities of preschool children,

primary school students should pay more attention to the person, to other children, to learn to know themselves.

Primary school students usually write (create) fairy tales (PI=30.2) (Table 4). The second position is the creation of fantastic essays or stories (PI=21.3). In the third place there are essays that end the sentence and the storyline is developed (PI=21.1). All the above-mentioned written works are related to the creation of images in the mind, their modification, modulation, selection, variation and merging, when the student creates visual perception in the mind.

Table 4 ***Ratings of imagination development by writing activities*** *(composed by the authors)*

ACTIVITY	PI
Students are asked to write:	
A fairy tale	30.2
Imaginary essays	21.3
Essays that finish the sentence	21.1
Possible case essays	10.2
The end of a fairy tale	7.3
Games	3.6
Scripts	-10.5

The imagination of the students is cultivated during the creation of fairy tales and fantastic essays, because their plot has little to do with reality, many details need to be invented. Imagination development by transmitting internal images using verbal codes is most often applied to teaching Lithuanian or foreign languages. One example of this is writing essays. Only one statistically significant difference was found: schoolchildren in the district (average grade 184.40) are more likely to be asked to create the end of a fairy tale end than schoolchildren in the city (average rank 211.45; Z statistics $\int Z \int = -2.553$, and its p-value $p = 0.011$, i.e. $p\ \delta < 0.05$.

Analysis of the situation for the development of visualization skills in primary classes

Analysis of survey data on the development of visualization skills (Table 5) revealed that most teachers in lessons ask students to portray fantastic objects (PI=29.8). However, this is only one-third of the possible value, which means that primary class teachers rarely ask students to visualize fantastic objects in their practice. Students are rarely asked to visualize abstract compositions (PI=17), problem situations (PI=15.9). The fourth place (PI=9.3) is the representation of the essence of the topic in schemes. These data suggest that visualization is most commonly applied to Science, Maths, and sometimes language teaching.

However, the frequency of application of visualization is very low, which reveals that about 60% of all lesson activity is devoted to other activities by teachers.

Visualization in primary classes is most commonly applied in art lessons, when it is necessary to portray fantastic objects, the second place is the portrayal of abstract forms. However, all this is done in the field of art education, and in all other lessons it is done much less often. This means that teachers rarely try to get their students accustomed to subjective thinking. Obviously, even in the arts lessons, where visual thinking should be educated most, very little attention is paid to abstraction. This implies the need for creative tasks

Table 5 ***Ratings of visualisation skills' development by respective activities***
(composed by the authors)

ACTIVITY	PI
Students are invited to represent:	
Fantastic objects	29.8
Abstract compositions	17
Problem solving situations	15.9
The essence of the topic in schemes	9.3
The essence of the topic in tables	3.6
Different folk symbols	-1.5
Symbols created by students and meaning the topic objects	-7.1

Fantastic objects are mostly depicted by primary school students living in districts (average rank is 209.55). Z statistics ∫Z∫ = -2.300, and its p-value p = 0.021, i.e. p δ < 0.05. There is also a statistically significant difference found between district and city schools in portraying various folk symbols, the students living in the district are more likely to draw folk symbols (average rank 208.64) than the city students (average rank is 186.36); Z statistics ∫Z∫ = -2,092 and its p-value p = 0.036, i.e. p δ < 0.05.

By analysing the survey data on the areas in which students create schemes, charts, tables and popularity index (Table 6) it can be stated that in Maths lessons students most often draw schemes, tables and charts (PI = 23.9). In the second place it is the field of science education (PI = 5.6), but the popularity index is quite different from Maths. In social education, Lithuanian primary school students almost never make any of the above-mentioned visualization elements.

Students living in districts (average rank is 209.67) are more likely to study Maths through schematic visualization than those studying in cities (average rank – 185.65, Z value ∫Z∫ = -2.516, and its p-value p = 0.012, i. e. p < δ = 0.05). Similarly, it was found that district students (average rank – 209.34) more often than city students (average rank – 185.87) compile schemes, tables and charts while studying Science (Z value ∫Z∫ = -2.086, and its p-value p = 0.037, i. e. p < δ = 0.05).

Table 6 ***Rankings of education fields in which students compile schemes, tables and charts*** *(composed by the authors)*

EDUCATION FIELD	PI
Maths	23.9
Science	5.6
Language education	-12.1
Social education	-41.8

In order to deepen the results of the study analysis, a link was sought between the use of visual instruments and the preparation of schemes, tables and charts in Maths teaching and Science education. The Kendall' tau-b correlation results show that there are statistically significant relationships between all variables, but their strength varies. A statistically weak link has been established between the visual tools used by pedagogues in teaching Maths and the tables and schemes compiled by students in learning Maths ($r = 0.395$, $r > 0.3$, the relationship is weak, but statistically significant, because $p = 0.000$, i.e. $p < 0.001$). Those teachers, who themselves use visual aids, probably also see the importance of visualization in learning Maths, encourage their students to make more efforts.

There is a statistically significant ($p = 0.000$), but weak ($r = 0.301$, i. e. $r < 0.3$) relationship between the visual aids used by pedagogues to convey Science knowledge and the tables, schemes compiled by students to deepen their Science education. It can be assumed that the more the teachers themselves use visual aids in teaching Science concepts, the more they encourage students to visualize information from verbal or numerical codes to visual. There is also a statistically significant ($p = 0.000$), but weak ($r = 0.349$, i. e. $r < 0.3$) relationship between the processes of visualization in Maths's teaching and Science education. It can be said that the more schemes are drawn, the more tables are compiled in Maths's teaching, the more this is done in Science education and, of course, vice versa.

Knowing that in district schools primary schoolchildren are more likely to produce visual instruments for Maths and Lithuanian subjects, it is important to find out what place the production of visual aids occupies in the general context of the use of visual instruments. The popularity index indicates that students do not almost completely produce visual aids themselves. The PI shown in Table 7 indicates that the ratings are very low, three of which are negative, i.e. indicate a negative level of aspect. The results discussed earlier indicate that there is a greater tendency in district schools to develop the visual thinking of students by producing their own visual tools. Although the students themselves produce visual aids for language teaching very rarely (PI=-15.4), such activities are more encouraged in district schools.

Table 7 ***Ratings of education fields for which students produce their own visual aids***
(composed by the authors)

EDUCATION FIELD	PI
Maths	3.1
Science	-3.3
Language education	-15.4
Social education	-29.8

In teaching Maths in district schools, students are asked to produce visual aids more often (average rank 220.35) than students in cities (average rank 178.21); Z value ∫Z∫ = -3.769, and its p-value p = 0.000, i. e. $p < \delta = 0.05$. Statistically significant difference is also observed in the field of language teaching - Z value ∫Z∫ = -2.545 and its p-value p = 0.011, i.e. $p < \delta = 0.05$. Students in district schools are more likely to produce visual instruments for language teaching (average rank 212.48) than students in city (average grade 183.68). Students both in district and in city almost equally produce visual tools Science education and social education, statistically significant differences have not been found.

Conclusions

The results of the research reveal that the development of imagination by conveying internal images with verbal codes is most often applied in the teaching of Lithuanian or foreign languages. Primary teachers most often develop imagination through the activities of storytelling (most often - writing tales, creating fantastic writings, storytelling), acting as fictional characters, imagining life situations, which are related to creating images in mind, changing them, modulating, selecting, variating and joining. Statistically significant differences are revealed, where district teachers, more often than city teachers, ask students to create fictional characters or the ending of a fairy tale.

The analysis of the situation in the education of visualization skills reveals that in the subjects of Mathematics, language teaching, Science, students living in the district more often draw folk symbols, produce visual tools themselves, visualize information into images than city students. Students usually present fantastic objects, schemes, tables and diagrams during lessons. Cultivation of imagination helps students to better understand the works of literature, the characters and the text being read; existing and missing elements of the task, see objects with inner vision, and solve the task faster.

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