PRESCHOOL CHILDREN AND THEIR PRECONCEPTIONS OF NATURE IN A NURSERY SCHOOL SETTING

Pavla Krátká
Alena Srbená

Department of Primary and Pre-Primary Education,
Faculty of Education
Palacký University Olomouc

kratka@mucl.cz
alena.bercikova@upol.cz

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Summary

The present paper focuses on preschool children's pre-literacy in natural science with an emphasis on their preconceptions of nature in the current conditions of nursery schools in the Czech Republic. The key objectives of the paper include the following: *Examine how children interpret the term nature*. The objective and focus of the paper are based on the assumption that if people understand the theory of a particular topic, they are also interested in its practical aspects. In the context of nature and its protection, this idea may be interpreted as follows: If we understand nature and its fundamental laws, we can protect it better. Nature and environmental protection is becoming increasingly relevant and must be supported from early childhood from a global perspective.

Keywords:
Children's preconceptions, preschool age, nursery school, environmental education, awareness raising, Czech nursery school

INTRODUCTION

From birth, people are in constant interaction with their environment. The way children perceive and interpret the world is completely different from adults. People who spend time with children including parents and teachers know that children sincerely open their heart and mind. However, if we want to explore children's potential and see what they understand and how they think, we really need to listen. As confirmed by teachers, the fact that children make their own conceptions of various phenomena is indisputable. They are referred to as preconceptions. The present paper focuses in detail on the preconception of nature in the context of the national Czech curricular document which is the Framework Education Programme for Preschool Education published in 2018. The formulation of the theoretical background of the research study is primarily based on the conditions of the Czech Republic. However, the topic is also considered in an international context.

COGNITIVE PROCESSES AS THE KEYSTONE OF KNOWLEDGE

Cognitive processes (from the Latin *cognito*) are the activities of an individual's psyche that mediate learning. The objective state of reality is greatly influenced by the subjective level of an individual including the individual's abilities. All of these factors result in mental activity. Therefore, this is a complex of processes through which an individual learns about oneself as well as the surrounding phenomena. The cognitive processes that form the basis of learning and are essential for human intellectual development include particularly thinking and attention, memory, sensing and perception as well as imagination and fantasy. In the context of preschool education, the area of children's cognitive development is extremely significant (Nádvorníková, 2011).

A typical feature of preschool children is intuitive thinking, which Piaget (2014) refers to as the stage of cognitive development. The laws of logic are not yet respected by children, their thinking is distorted, one of the characteristics of this period is egocentrism.

Regarding the fact that children learn to understand the reversibility of various transformations in a gradual way with regard to their complexity, it can be concluded that the development of thinking is a long-term process. In this con-

text, Šimíčková Čížková et al. (2010) add that in the preschool period, children's attention is unstable and involuntary and that its focus improves with age. It is influenced not only by the individual's temperament but also the type of activity that requires attention. As far as memory is concerned, remembering and storing of information is spontaneous. Mechanical memory is dominant and children are capable of covering a broad range of information. Conscious remembering starts to appear around five years of age. Emotions have a considerable effect on remembering various things or situations. Thanks to emotions, children are able to remember a situation for the whole life (Mertin, Gillernová et al., 2015). The preschool period is dominated by syncretic perception, which means that the child notices distinctive objects that that relate to the child's ongoing activity (Šmelová et al., 2016).

In preschool children, the processing of knowledge from the outside world has several features. One of them is absolutism—the child is convinced about the validity of each statement, which reflects an important need of every child: certainty. Other features include anthropomorphism, which is the attribution of human qualities to inanimate objects, animals, and mythical characters, or artificialism, according to which children for example believe that someone had to place the plants in the soil or someone had to fill up the lakes with water—this is how children perceive the surrounding world. The last feature is magicality, which means that the child does not differentiate between reality and fantasy and in this way helps interpret the world (Vágnerová, 2012).

CHILDREN'S PRECONCEPTIONS OR WHAT WE CURRENTLY KNOW ABOUT THEM

The first ever scientist to present a theory of children's preconceptions and their formation was no other than Jean Piaget. In his work The Psychology Of The Child (2014), which focuses on child development, the author claims that everything that surrounds an individual and interacts with the individual affects his/her development. Therefore, learning should be in harmony with this development.

According to Mandlíková (2011), a preconception could be defined as a process of transformation, integration and acquisition of completely different or new information. This is an assessment complex which consists of questions with a

reciprocal effect. Depending on the situation in which individuals are, their preconceptions are mobilized and adapted to the situation. New emerging facts go through a decoding structure that makes the information relevant. Regarding the fact that cognition is in interaction with the preconceptions and knowledge that can be gained from it, a preconception is a kind of intermediary between a piece of knowledge and the structure of thought. Therefore, a preconception is not the 'springboard' to or the result of the structure of knowledge but rather the instrument. In order to achieve new and therefore better knowledge, the original knowledge must be rebuilt. Doulík (2005) adds that the idea that a child makes about a specific class of objects (whether animate or inanimate) or events is nothing else than a preconception. After encountering new things, experiences and problems, children try to understand everything by integrating the new in what is already known. However, this procedure may not always be the right one. The new knowledge needs to be adapted or a new conception needs to be created. However, even a new conception can usually be related to what the child already knows.

Children's preconceptions are based on various experiences, mental processes and emotional colouring. Most preconceptions are developed before children start attending school. The form of preconceptions is strongly influenced by subjective components. They are also the result of conscious and unconscious experiences, but they are not invariable. As far as the knowledge system in concerned, they are firmly embedded in it, showing a constant cognitive structure (Průcha, 2013).

Preconceptions Versus Misconceptions

In international literature, the terms misconception and preconception tend to be used analogically and in fact do not differ from each other. However, according to Mandlíková (2011), in the Czech Republic the term misconception refers only to a wrong conception. The author suggests that this term should be used to refer to structurally important assumptions that could in the future result in fundamental errors in relation to the system of children's opinions. Misconceptions are thus discordant and non-scientific. Larochelle & Desaults (In Bertrand 1998) add that misconceptions are incorrect against a specific norm, their origin is often in misunderstanding, incorrect comprehension of the learning content or insufficient explanation by the teacher; an error was not corrected and was retained.

Pivarč (2017) refers to two types of misconceptions. The first type includes spontaneous misconceptions developed in the process of cognition as part of recurrent experience. The second type is based on targeted and direct action of school-based education.

ENVIRONMENTAL EDUCATION AND AWARENESS RAISING IN CZECH NURSERY SCHOOLS

In the present era, a frequent collocation used by professionals as well as the general public is 'environmental education and awareness raising' (EEAR). One could say that we as mankind are beginning to realize the importance of nature in our lives. There are a number of studies[1], whether international or Czech, that point to many positive effects of greenery on the development of an individual, especially during the early stages. EEAR is currently a legislative obligation. It is not only defined by law[2], but it is also reflected in the binding curricular document, which is the Framework Education Programme for Preschool Education (FEP PE). The document sets out important conditions, rules and requirements for the education of preschool children in the Czech Republic and is an official guideline primarily for teachers but also for school authorities (Jančaříková, 2010). The FEP PE is the framework for another school-level document, which is the School Education Programme (also referred to as the SEP) (FEP PE, 2018).

On a general level, the goal of EEAR is to support those individuals who are interested in nature protection. In nursery schools (also referred to NS), EEAR provides children with personal experiences and nature is perceived through all senses. In this way, nature becomes a space where children play, learn and also relax. EEAR helps children develop their awareness of the diverse forms of life, encourages their responsibility for the environment and with respect to their

[1] In his publication *Děti venku v přírodě: ohrožený druh?* Daniš (2016) presents a number of research studies from around the world confirming that all people and especially children need to stay outdoors in nature in order to maintain their physical, mental as well as social health.

[2] The Environmental Protection Act No. 17/1992 Coll.; EEAR is also defined in Act No. 561/2004 Coll., on Pre-School, Basic, Secondary, Tertiary Professional and Other Education; specifically, Section 2 stipulates the principles and goals of education, where the general goals of education are defined as *"the acquisition and application of knowledge of the environment and its protection arising from the principles of sustainable development."*

capabilities helps form their ideas about humans and their mission within this system. The FEP PE defines the key competences, while the elaborate system of EEAR offers possibilities of their attainment and development (Leblová, 2012).

The methodological guideline to ensure environmental education and awareness raising (2008) refers to a system of comprehensive development of the key competences (as defined in the FEP PE) in the context of the relationship between an individual and the environment. This primarily includes the following: *"Motivation and provision of opportunities to attain knowledge, skills, attitudes and habits to protect and improve the environment, to shape a hierarchy of life values compatible with sustainable development, to engage in creative activities to improve the environment and to adhere to a sustainable way of life and sustainable patterns of behaviour of individuals, groups and society as a whole. EEAR needs to be linked with health and a healthy lifestyle."*

At work and application EEAR in preschool education terms is necessary to know, how is the problematics of EEAR represented in Czech curriculum document FEP PE. As the analysis of FEP PE authors (Berčíková, Petrová, 2014) proves, the general problematics of EEAR is reflected in all educational fields, despite that one of those fields is devoted to EEAR *The child and the world*. The analysis also shows that average appearance of EEAR in partial educational objectives, educational offer, expected outputs and the key competences, ranges between 30% and 40%.

RESEARCH DESIGN

Given the topic of the study, the research is of a qualitative nature.

The main objective of the research is to examine how children interpret the term nature in the conditions of Czech nursery schools. The empirical evidence of the research further focuses on the following partial objectives:

- Identify and describe the components that are according to children present in nature.
- Discover how children understand behaviour in nature.
- Identify the ways children have attained their present knowledge.

The principal research question is as follows: *How do preschool school children*

conceive nature? Regarding the fact that the question is relatively broad, it was subdivided into secondary research questions in order to provide a wider range of responses. The secondary research questions will also help analyse the relevant contexts.

Secondary research questions:

- In what ways have preschool children attained their knowledge about nature?
- Which components are present in nature according to preschool children?
- How do we behave in nature according to preschool children?

The principal data collection method was drawing of nature complemented with semi-structured interviews. An additional method was direct non-standardized participant observation, which proved to be an excellent method to identify many other phenomena including the component that each child drew first, the impression that the children made during drawing, whether they were confident or not, delay between individual components, whether the children made any comments. During the research, it was also possible to focus on pencil grasp and overall body posture during drawing.

The research sample comprised 10 preschool participants (6 girls and 4 boys). The lower age limit was four years. At the beginning the research sample also included younger children (total of three) but it was not clear whether they understood the term *nature* and during the drawing stage they were unable to concentrate after a short period of time. After drawing one to two components (always a tree and a flower) they did not know what to do next. Their answers to the question *How do you think we behave in nature?* was always *"Nice"* without a more elaborate statement. Another phenomenon observed in a three-year-old boy at the beginning of the drawing stage was his incompetence to hold the pencil to be able to draw as he wished. This made him terminate the task: *"I… simply can't draw".* In order to obtain a greater body of useful data, the research focused on older children. In the results of the research, the children included in the study are identified as C1–C10.

The data were analysed after each interview. The participants attend a nursery school with two classes—one of them is for children from two to four years of age, while the other one is for children from four to six. It is an urban nursery school located in the periphery.

NATURE FROM THE PERSPECTIVE OF PRESCHOOL CHILDREN IN CZECH NURSERY SCHOOLS

Before the results of the study are presented, the text below provides a definition of the term *nature*, which may be quite difficult. The term is not defined by law. Nature is considered in different ways by different people—for example an environmental professional or science teacher. It is because each of them has a different mission. Therefore, the definition for the purposes of the present paper is a broad one, as suggested for example by Anděrová (2013) who claims that nature includes all living organisms together with their natural environment. It consists of fauna (animals), flora (plants), fungi and inanimate nature. Inanimate nature includes the general form of various substances that lead to certain processes such as radiation. In addition, this category also includes specific parts of nature such as waters, rocks, atmosphere and even stars and the sun.

The first subchapter entitled Who Was 'the Teacher' was included at the beginning because during the process of code categorization and subsequent development of the structure it turned out that this concept was absolutely crucial. The children's awareness of nature that they presented was dependent on where they had acquired their knowledge.

Who Was 'the Teacher'?

One of the many features of a preconception is that it originates or is transformed on the basis of a constant contact with the environment, whether it be a narrower environment (family, educational institution) or a broader environment (everything that surrounds us). Therefore, the authors first focused on the process of gaining knowledge, that is, who or what is the primary bearer of information which is then passed on to the child and used by the child to make a preconception about nature.

Preschool children spend a considerable amount of time with their family or in nursery school where they meet with their peers and teachers. This is reflected in the results of the research in which the children were asked the following question: *"Where did you learn everything about nature?"* For better clarity, Table 1 below shows who 'the teacher' was. The responses are coloured and arranged in order where the 2nd attainment of knowledge reflects the information added after a question on other possible sources of information about nature. These are the youngest children whose attention tends to be involuntary and volatile.

Table 1. Who was 'the teacher'

Research Participants	1st attainment of knowledge	2nd attainment of knowledge
C1	Parent	NS
C2	Own knowledge	Parent
C3	NS	Parent
C4	Own knowledge	Parent
C5	NS	X
C6	Own knowledge	NS
C7	NS	X
C8	Parent	NS
C9	Own knowledge	NS
C10	NS	X

Almost all of the children in the research sample claim that they obtained the knowledge in nursery school. The teacher is the main source of information. For example C8 says: *"The teacher probably knows everything… She told us about trees, for example, what grows on them. And that they give us air… So we would die if there were no trees. And when I want to know something, I ask her."* or C9: … *"The teacher tells us about things. For example, when we go out for a walk, she tells us about the things we come across."* The responses suggest that the theme of nature is not alien to the particular nursery school, it is not covered only as prescribed by the weekly plan but is reflected in a number of spontaneous activities during the day in the establishment. Through their own curiosity, children gain a lot of knowledge in this area.

The family is the main socializing agent for the child. It is therefore likely to affect children's preconceptions. It becomes the primary "institution" that provides the child with a large amount of knowledge, skills and experience. As shown in Table 1, exactly one half of the participants state that their parents are another source that provides information about nature. C2 says: *"…I also know that from my mum and dad… When I ask something, they tell me what it is. And sometimes we read a book with my dad, there are all animals you can see in nature. And everything is written about them, so when you want to learn something, you can read it there."* The response suggests that the parents are those who arouse children's interest in learning more about nature.

Obviously, the children's own knowledge is not the primary source of informa-

tion related to nature but children also emphasize this domain, as suggested by the response of C4: *"…At home in the garden I can see everything from nature, what grows there, we have lots of flowers in the garden and also trees and some vegetables. We grow them with my mum, so I know about it."* The cognitive component of the preconception is based on the information that the child receives from the surrounding environment and also through the child's own experience. Therefore, the child's own cognitive activity is very important in terms of preconceptions.

Emotions and Long-Term Memory

It often turns out that an activity or a specific situation that had an emotional effect on the child (whether negative or positive) was stored in the child's long-term memory. This fact was reflected in the drawings or the interviews. This is evidenced by the children's drawings of bees, which later became the dominant feature of their drawings of nature. Specifically, participant C7 enjoyed the activity, the teacher followed with a presentation on bees, which resulted in remembering. This is also demonstrated by the opinion of participant C4: *"We went to the zoo with mum and dad and by the road we saw a lot of rubbish, clothing and something that people didn't want anymore, so they threw it away. And dad was really angry… He said that people are lazy to take it to collection points and they leave it here... There are also dustbins for all sort of rubbish."* The parents' indignation is also mentioned in other places of the interview. Obviously, the emotional experience had an effect here.

What Is Nature?

Preschool children see nature as a place made of living organisms including animals, plants and fungi. More than half of the children also mentioned the sun and clouds. Table 2 shows a list of all the components present in the drawings.

As far as the preconception of nature and natural components is concerned, a number of children show the so-called anthropomorphism, which means that they attribute human qualities to animals. This is illustrated for example by the statement of C3: *"I would like to add more flowers and butterflies so that this one is not sad..."* C4 made a similar comment concerning the drawing: *"This is Betka, my little girl, and this is what she really looks like! I will draw one more so that she's not sad, but at home I've got only one."* The statements may reflect the subjective

feelings of the child including fear of loneliness. Another clear misconception was suggested by C6 who drew a fox on a tree branch. When asked how the fox got there C6 replied with confidence: *"Of course she climbed there!"*

Pets are also considered part of nature; domestic animals such as the dog, horse or car were included in the drawings or mentioned during the follow-up interviews. C8 sees animals from the zoo in a similar way: *"I have a parrot in a cage, a lion, also in a cage, he has a big cage, it must be a big cage because the lion is big. And I also have a cat in a cage and a duck in a cage. This is like a zoo. This is also nature because there are animals…"* In an inductive way, the child makes a conclusion suggesting that if there are animals (components of nature) in a specific place, the place itself is nature. However, C3 has a completely different perspective of the zoo. C3 urgently explains why an elephant should not be included in a drawing of nature: *"Because it's in the zoo, that's not nature... Nature is not locked up animals!"*

In the eyes of children, a specific part of nature is the forest. When the children were asked what else they associated with nature, C1 replied with confidence: *"Forest of course! But it won't fit in the picture, the forest is too big… If it wasn't big, it wouldn't be a forest!"* Logically, on the basis of the primary attribute of the forest, the child defends the conception. C1 also makes a remark on the forest: *"I have a deer here, it lives in the forest, and a fox, it also lives in the forest…"* The term nature also included the idea of an island. According to C6 this is also part of nature but in a different sense: *"Well, an island is in the sea for example, it has sand and it's warm, there are different animals, for example a colourful toucan and palm trees! And there's also sand, it also belongs to nature I think…"* It appears that preschool children's awareness of nature can be quite extensive. Some of them even mentioned parts of inanimate nature, which is quite extraordinary. This can be influenced by the fact that it is simply inanimate nature. In addition to sand, the only component on inanimate nature was the soil. This was mentioned by C3, but rather unwittingly: *"… There's a blue flower. Next to is there's a tree, they grow from black soil. The soil is everywhere and there's also grass…"* The child even mentioned the black colour of the soil but the overall expression clearly suggested that the child did not intend to draw black soil as higher-quality soil for plants.

A very contrasting component in the identification of the children's preconceptions about nature was the human being. In some drawings it has a dominant position. For example, C10 describes the drawing in the following way: *"… I have a small stream, it starts here by the tree. People can bath in it. So here is a mark*

meaning that they can have a bath here. And I also have two people here, the boy is picking blueberries…" Human beings are considered an integral part of nature and have the opportunity to carry out many activities in nature. The mark identifies the place where bathing is permitted. This suggests that the child probably knows that in some places in nature it is prohibited to bath. With confidence, C2 explains who the house in the drawing belongs to: *"It's people's of course! They sometimes live in nature, so they belong here."* The reason why human beings are components of nature is the fact that they can live in nature. On the contrary, C9 ousts human beings from nature: *"You know, a person is not nature, people make mess in nature."* Due to their improper behaviour, they cannot be part of nature. A human being appeared in the drawings in connection with a human dwelling where nature was a mere complement. In one drawing, a human being was depicted as a "visitor" of nature.

Table 2. Components present in the participants' drawings

Component of nature:	Frequency in the drawings
Grass	10
Flowers	8
Trees	6
Sun	6
Clouds	6
Butterfly	5
Ladybird	3
Tulip	3
Bee	3
Fox	2
Human dwelling	2
Human	2
Cat	2
Bush	2
Spider	2
Forest	1
Hedgehog	1
Sky	1

Component of nature:	Frequency in the drawings
Deer	1
Squirrel	1
Soil	1
Tick	1
Fungus	1
Water	1
Spring	1
Dandelion	1
Tortoise	1
Bird	1
Spider web	1
Snake	1
Pond	1
Snail	1
Crayfish	1
Beehive	1
Parrot	1
Lion	1
Duck	1

Table 2. *Components present in the participants' drawings* shows that the most frequent component was grass, which appeared in all of the drawings. It is probably because children usually notice this component, play on it and are in contact with it, not just visually. The second most frequent motive which appeared in a total of eight drawings was the motive of flowers. Also here, one can sense that children are in contact with this component on a regular basis. The same applies to the third most frequent motive of trees, which appeared in six drawings. It should be noted that both deciduous and coniferous trees appeared. As was suggested by some of the children, their teachers provide information about nature when they are on walks. It is therefore clear that if this presentation is repeated and accompanied by the child's personal experience, it is then stored in the long-term memory. Another component was the sun with clouds. This component appeared in a total of six drawings. The respondents

also mentioned interviews about the weather during nursery school activities, which may also be reflected in the drawings of nature. In half of the drawings (five) the children drew a butterfly. In three drawings there is a tulip, a ladybird and a bee. Two drawings included the following components: human dwelling, cat, bush, spider. The remaining components appeared only once. If we tried to create a picture with the six most frequently depicted motives, it would look like this: grass with flowers, trees, sun and clouds, and also an insect component (butterflies).

Due to the large number of components that appeared in the drawings, they were divided into groups according to their features for better clarity, see Table 3 *Groups of components in the participants' drawings*.

Table 3. Groups of components in the participants' drawings

Group of components	Frequency in the drawings
Animals	19
Plants and fungi	8
Inanimate nature	8
Man and his world	4

Table 3 *Groups of components in the participants' drawings* shows that the drawings included a total of 19 animals. The animals were of various types, as suggested by Table 2. *Components present in the participants' drawings*. This group was a dominant one. The components of the plants and fungi group appeared eight times, the same in the case of inanimate nature. The component of humans and their dwellings appeared four times.

Mis/Behaviour in Nature

According to the children, nature is not only a place with many different species of plants and animals but also an area that needs to be protected, not destroyed. Naturally, it is not only about refined behaviour and not throwing away rubbish in nature, which the participants agreed on, but already in preschool age children start to build their attitude to something we call behaviour in nature and nature protection. In this context, C6 made the following comment: *"If we threw away rubbish there, the... the animals and also plants that live in nature would mind... And animals are unable to clear it away themselves. People have to do*

it." Participant C7, who was during the interview critical about exhaust gases in nature, adds the following: *"Well, nature is nice… Cars are driven by people, aren't they? So people probably should not belong to nature. People are destroying nature! Only animals should be in nature and people shouldn't go there… Animals don't destroy nature. Then it would be good."* The quotation suggests a degree of sanctity to nature, where human beings are becoming undesirable due to their inappropriate behaviour; nature should belong to fauna. This also suggests a degree of superiority over plant components, which are not considered an equal part of nature. This superiority is also confirmed by the following statement of C9: *"Well, animals are simply part of nature. Nature* is *theirs."* Preschool children also have a preconception about the creation of oxygen in nature, which is a necessity for the human body. C10 comments on this as follows: *"Trees give us air, so we need to value them. And for example, at Christmas we don't have a real tree from the forest, we have a plastic one, it's good for nature… We don't take a tree away from the forest so it can stay there and make air."* In this case, the child proposes a specific and relatively sophisticated example of how not to cause harm to nature. Similarly, C1 attributes significance to oxygen: *"Well... If there weren't trees, it would be difficult for us to breathe."*

According to the children, it is important to behave in nature; a detailed analysis of this general phrase reveals the need to respect all components of nature including those that they are squeamish about or that they dislike. C1 made an explicit remark concerning the forest: *"Well, for example by not destroying nature. Not killing ugly beetles."* C4 made a similar comment: *"Behave nicely, when we for example dislike something, a spider, we should still protect nature. Because those creatures don't hurt us either, and if they do, they just defend themselves."* These two statements suggest that nature protection is a serious issue among children. C4 even realizes the vulnerability of other creatures and the necessity to protect them from danger.

Children also have preconceptions relating to waste sorting. In this context, C4 made the following comment: *"…there is a bin for every type of waste."* The child also described how these bins are identified, what waste they are for and where they are located. During the interview about behaviour in nature, C10 also mentioned *RecycleGame* which they played in their nursery school: *"The teacher explained where for example paper or glass should be placed, it's called RecycleGame…"* Clearly, children's awareness of waste sorting is developed already in preschool age.

DISCUSSION AND CONCLUSION

A very important cognitive process, as suggested by the research, is children's attention. Preschool children younger than four years were eventually not included in the research due to their unstable attention, which prevented them from finishing their drawings. This is also described by Šimíčková Čížková et al. (2010), who claim that attention at this stage is unstable and involuntary and that it improves with age. This assumption was confirmed by the research study. During the preschool period, children's cognition focuses exclusively on the world that surrounds them. Piaget (2014) coined this period the stage of cognitive development. Piaget's statement has been confirmed by the present research; several times the children focused exclusively on the surrounding distinctive or well memorable elements. Anthropomorphism became a common feature of children's knowledge processing. According to Vágnerová (2012), anthropomorphism is the attribution of human qualities to inanimate objects or animals. In the research, some of the animals were sad. As expected, with age the elaboration of the drawings including details increased. The same applied to the children's awareness about nature.

During the drawing and the follow-up interview, some of the children focused on the details that they believed were important, including the description of the body parts of a squirrel or blueberries on the bushes. This confirms the assumptions of Doulík (2005) and Henley (2000) who claim that children's responses to the surrounding world and the way they interpret it is the consequence of their distinctive perceptions and attention. Children's preconceptions are based on various experiences and emotional colouring. This is confirmed by the data obtained in the course of the research (peculiar opinions concerning the research theme). For these reasons, these preconceptions cannot be generalized.

The text below suggests possible areas of future research. The empirical part of this paper focused on the preconceptions of nature from a relatively broad perspective. Therefore, a follow-up research study could focus solely on living nature. Another possibility is to examine the preconceptions of nature from a longitudinal perspective including the transformation of these preconceptions into the so-called scientific concepts.

Although the Czech system of education is constantly undergoing a significant transformation and the transmissive-instructive model is still apparent, this style is not fully open to the construction of children's cognition based on examining their existing knowledge. An important aspect is the support of constructivist

learning which focuses not only on diagnosing children's preconceptions.

Children's preconceptions can have a significant impact not only on the transfer of knowledge by the teacher but also on the child's learning. Therefore, the teacher should try to diagnose the child's preconceptions and work with them in a meaningful way.

Below is a final thought: *"Research studies suggest that the time spent playing in nature in childhood strengthens responsible behaviour to the environment in adulthood. At the same time, we know that children spend less time outdoors compared with the generation of their parents. What are the consequences? When these children grow up, will their behaviour still be environment-friendly? Does the insufficient contact of children with nature jeopardize the future chances for nature protection?"* (Daniš, 2016, p. 28).

This is one of the questions that the theme evokes and it will surely gain importance in the future. Therefore, it is necessary to address the topic both in theory and practice as part of formal education from ISCED 0 and strengthen the awareness in the families of small children. In the context of the Czech curriculum and preschool education, this theme is addressed proportionately as per applicable legislation. We believe that in Czech nursery schools, this theme deserves more attention.

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Predškolska djeca i njihove predodžbe o prirodi i vrtiću

Sažetak

Ovaj je rad usmjeren na prirodoslovnu pismenost djece predškolske dobi s naglaskom na njihove predodžbe o prirodi u trenutačnim uvjetima dječjih vrtića u Češkoj. Ključni ciljevi rada uključuju sljedeće: Proučiti kako djeca tumače pojam priroda. Cilj i fokus rada temelje se na pretpostavci da, ako ljudi razumiju teoriju određene teme, zanimaju ih i njezini praktični aspekti. U kontekstu prirode i njezine zaštite, ova se ideja može protumačiti na sljedeći način: Ako razumijemo prirodu i njezine temeljne zakone, možemo je bolje zaštititi. Zaštita prirode i okoliša postaje sve važnija te se iz globalne perspektive mora se podržavati od ranog djetinjstva.

Ključne riječi:
dječje predodžbe, predškolska dob, vrtić, ekološko obrazovanje, podizanje svijesti, češki vrtić