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THE COGNITIVE LAERNING THEORY IN PRESCHOOL EDUCATION IN SLOVAKIA

Abstract

In the theoretical part of the article, the psychological foundations of cognitivism and the possibilities of using its elements in preschool education are explained. The research part discusses the results of a study on the application of the cognitive concept in early childhood education in Slovakia. A questionnaire was used as a research tool. 72 teachers took part in the research. The authors emphasize the importance of introducing innovations in preschool technical education, as there is no information in literature about research on educational concepts for preschool children. Available research results focus on primary or higher education. Hence the presented study provides a new, original view on the issue of educational concepts, especially in technical education in kindergartens.

Keywords: the cognitive learning theory • educational concepts • kindergarten • technical education • questionnaire.

TEORIA KOGNIWISTYCZNA
W PRAKTYCE EDUKACYJNEJ PRZEDSZKOLI NA SŁOWACJI

Streszczenie

W części teoretycznej artykułu wyjaśniono psychologiczne podstawy pedagogicznego kognitywizmu i możliwości zastosowania jego elementów w praktyce przedszkolnej. W części badawczej omówiono wyniki badań nad stosowaniem koncepcji kognitywistycznej w edukacji w słowackich przedszkolach. Jako narzędzie badawcze wykorzystano kwestionariusz. W badaniach wzięło udział 72 nauczycieli z przedszkoli na Słowacji. Autorki podkreślają znaczenie wprowadzania innowacji w przedszkolnej edukacji technicznej, ponieważ w literaturze brak informacji o badaniach dotyczących koncepcji edukacyjnych stosowanych na poziomie przedszkolnym. Dostępne wyniki badań, koncentrują się na szkole podstawowej lub wyższej. Stąd prezentowane opracowanie stanowi nowy, oryginalny pogląd na kwestię koncepcji edukacyjnych, szczególnie w edukacji technicznej w przedszkolach.

Słowa kluczowe: teoria kognitywistyczna • koncepcje edukacyjne • przedszkole • edukacja techniczna • kwestionariusz.

Introduction

Many different educational approaches were implemented in the educational system during the history. These approaches were changing according to the development of opinions about cognition and its acquisition and on the base of new psychological knowledge gradually penetrating to pedagogic practice. Changing society and the educational system went in hand with changing opinions about kindergartens.

In the beginning, kindergartens were seen as centers for preschoolers. Nowdays, kindergartens are understood as educational institutions preparing children for their future life in society (Molnárová, 2019). Doušková (2008) sees kindergartens as institutions that provide not only care for preschoolers, but also knowledge transfer, acquisition of new skills and their development. Values, attitudes and opinions accepted in the mainstream society are introduced to the children in kindergarten as well. Important factors in the education process in kindergartens are the child, the

teacher and the knowledge that the child should acquire (Doušková, 2008). Contemporary kindergartens are based mainly on humanistic education theory derived from the concepts of two important authors, A. H. Maslow and C. Rogers. It is based on children themselves, their individual needs and internal experiencing. The humanistic concept puts the major emphasis on the non-cognitive side of personality development rather than on the children's knowledge development (Huľová, 2007). It focuses in particular on creating appropriate conditions for knowledge development, not on learning methods as such (Zelina, 2004). Appropriate conditions contributing to harmonic development of all aspects of the child's personality are extremely important, but the knowledge and thinking base, skills, attitudes and values are being created during the pre-school period (Huľová, Rochovská, & Klein, 2018; Rochovská, Huľová, Klein & Gašparová, 2019).

Therefore, it is necessary to concentrate not only on creating appropriate conditions for development but also on the processes of a child's acquisition of new knowledge as well. Knowledge-gathering mechanisms are the main objects of interest of cognitivist theory of learning, which has been applied to education in kindergartens in recent years.

Cognitivist Theory of Learning in the Practice of Contemporary Kindergartens

In a traditional way of teaching, teachers transferred their knowledge to children. The main method of teaching was transmission and memorizing. This way of teaching and learning has been criticized for a long time. According to Caine and Caine (1994), every single brain and every single child's way of thinking is unique and specific. This is the reason, why it is not possible for every child to learn the same knowledge in the same way. Precisely for this, the cognitivist concept of learning is increasingly being used today. The child discovers, transforms and compares new knowledge and implements them into the structure of knowledge, which the child has already acquired. Proponents of this theory claim, that the child's acquisition of knowledge is

based on its activity and own experiences. Previous experience and knowledge are a significant factor in the acquisition of new knowledge (Olusegun, 2015).

The cognitivist theory is based on psychological constructivism and its findings, mainly on J. Piaget's concept of a child's cognitive development and studies by L. S. Vygotsky who created a social theory of child development as well (Atkinson, 2003; Rochovská, 2014).

A psychological constructivist, Jean Piaget created his cognitive theory. This theory is based on distinct stages of cognition development from birth to the age of adolescence. He divided the cognition development into the four stages:

1. stage of sensio-motor intelligenc,
2. stage of preoperational thinking,
3. stage of concrete operational thinking,
4. stage of formal operational thinking (Piaget, 2001).

Piaget (2001) says, that these stages always follow in the same order, any of the stages can't be skipped and the next stage is based on the previous one. He named it as preconception. A social constructivist, Lev Vygotsky developed a social development theory. Unlike Piaget, Vygotsky highlights the importance of the child's cultural and social background. He also highlights the role of language and its use. Vygotsky introduced new terms – current development zone and proximal development zone. The actual development zone represents the knowledge and skills, which the child can learn by himself. The proximal development zone represents the knowledge and skills, which a child can learn with the help of an adult (Vygotsky, 1979). These works, bud also many others are the basis for the cognitivist concept of learning. Psychological constructivism is concerned with knowledge acquisition forms. It also deals with the ways we think about our knowledge and how we form complex mental structures based on acquired knowledge in our minds. Mental structures are created but also reconstructed according to our knowledge (Sternberg, 2002). Cognitivist learning theory represents the way of thinking about cognition that can be of significant contribution when creating learning and teaching models and curricula materials (Turek, 2010).

Every child is different and employs its learning style while acquiring knowledge. This theory fully accepts individual learning styles. The cognitivist theory of learning is based on the activity principle. Children are active in the learning process and are considered as small researchers. Therefore, active manipulation, experimenting with teaching aids and their observation should be granted to them. This activity is their form of interaction with the world. Children construct their knowledge based on their preconceptions through this interaction. Children's preconceptions and their further knowledge development are closely connected with their cultural and social environment (Bertrand, 1998). Elements of the cognitive learning theory are included in the following table.

Table 1. Some elements of cognitive learning theory

Cognitive learning theory	
Approach to knowledge	Knowledge is individual and highly subjective for every child. The child's future knowledge depends on the level of their current knowledge development and is socially determined.
Approach to learning	Children discover their subjective meaning of the acquired knowledge. This subjective meaning of knowledge is determined by the social culture, prevalent during children's upbringing.
Learning process	Learning of children is based on their activities and problem-solving. Children learn from their peers through dialogue and collective work. New cognition is incorporated into the complex of knowledge via assimilation and accommodation.
Teacher's role	The teacher's role is to facilitate children's activities and learning during the education process in kindergarten. The teacher is an assistant who should help children overcome their obstacles.
Methods and strategies	The teacher deploys activities resulting in cognitive conflict between children's preconceptions and the real world. The children's conflict is resolved through learning. Following this, conceptual change takes place.

Cognitive learning theory	
	The teacher uses exploration activities enabling children to examine objects or phenomena and manipulate them with aids. The teacher deploys activities using discussion and dialogue methods enabling children to cooperate with their peers.
Children's activity	Children increase their knowledge through their own experience and physical activity. Children increase their knowledge through social interaction, cooperation and creation of new products.

Source: Processed according to: Vyskočilová & Dvořák, In: Kalhoust & Obst, et al., 2002, according to Molnárová, 2019, p. 42

Using of the cognitivist concept of learning has several advantages over classic teaching. Children learn more and they enjoy that they are active and involved in gaining their new knowledge. They are not just passive receivers. The cognitivist theory is focused on the thinking process and understanding. Memorizing is not important. Children can ask questions and answer their questions by research and experiment. They have the opportunity to manipulate with the real source of knowledge and real objects of the world, they learn for their everyday life need and they can test their theoretical knowledge in practice. This concept of education allows developing social and communication competences, it highlights cooperation and exchanging ideas between children (Olsegun, 2015).

Also, the cognitivist theory of learning has many benefits for children and their learning, but it has a significant effect on teachers. The teacher should accept children's autonomy, support their initiative and should offer a wide range of materials and primary sources to the children. The teacher should know about preconceptions of children. On the basis of these preconceptions, he facilitates children's learning and their development, encourages their curiosity, supports their questioning and dialogues between them (Brooks, Brooks, 1993).

Methodology of Research

Research is focused on the perception of educational theories in contemporary kindergartens. The main aim of this research is to find out which elements of educational concepts are used in practice the most. This information is very important for our next steps in research. It is important for the implementation of innovations in education in the context of technical education in Slovakia. This section deals mainly with the research results' interpretation focusing on the concept of cognitivist theory of learnig. To meet the ends of the research, a questionnaire consisting of 27 precisely articulated entries was developed. The questionnaire's entries were divided into three groups based on the factors of the education process in kindergarten:

1. entries regarding kindergarten teachers and their approach towards children;
2. entries regarding children and their activities during the process of education in kindergarten;
3. entries regarding contents and goals of the education process in kindergarten.

Entries connected with ideas of educational academism, educational humanism and cognitivist theory were presented in all three groups of the questionnaire. In the answer section of every entry, respondents were asked to express the degree, how much each statement characterizes respondent's educational process, based on self-reflection of his/her education process, on the scale from 1 to 4:

4 – It completely characterizes
3 – It sometimes characterizes
2 – It does not characterize sometimes
1 – It never characterizes

Index keys based on this ranking were created for the answers' interpretations. If the index of respondents' answers is closer to 1, the degree of characterization of the entry is lower. If the index of respondents' answers is closer to 4, the degree characterization of the entry is higher. However, it was still necessary to determine a boundary between characterization. The boundary was determined in the following way:

Table 2. Key to the interpretation of research results according to indexes

	Indexes
The statement characterizes my education practice.	2.6 – 4
The statement does not characterize my education practice.	1 – 2.5

Source: Molnárová, 2019, p. 55.

Sample of Research

The research sample involved 72 kindergarten teachers from all over Slovakia. Respondents were obtained through the available choice technique. The questionnaire was converted into electronic form and published in a group of kindergarten teachers on social networks. Those who were interested took part in the research.

Hypotheses

For the purpose of the research we established several hypotheses.

H_1: We assume, respondents prefer elements of cognitivist learning theory more than elements of educational humanism in the teacher-focused part of the questionnaire.

H_2: We assume, respondents prefer the method of experimentation more than passive learning.

H_3: We assume, respondents prefer the method of dialogue more than the method of monologue in education.

H_4: We assume, respondents prefer to teach skills for everyday life need more than general knowledge in education content.

Research Results

To meet the targets of this research, we offer only interpretations of results directly related to the cognitivist theory of learning. The interpretation of research results is presented in the form of tables and their analysis. The analysis is presented in the following few steps:

1. analysis of findings from that part of the questionnaire which was focusing on teachers and their approach towards children,

2. analysis of findings from that part of the questionnaire which was focusing on children and their activity during the education process in kindergarten,
3. analysis of findings from that part of the questionnaire which was focusing on the contents and goals of education and upbringing in kindergartens.

In the tables with interpretations of the research, the full text of every single questionnaire's entry is shown. The analysis pays attention only to entries that express cognitive theory ideas. Entries related to other education theories and their indexes of (dis)agreements are presented with respect to the reader's needs such as acquaintance with the individual questionnaire's entries and their comparison. Individual theories are color-labelled for greater clarity's sake:

Academic theory	Humanistic theory	Cognitivist theory

Research findings focused on teachers and their approach towards children

Table 3. Research findings focused on teachers and their approach towards children and the index of their responses

Questionnaire entries	Index
1. Teachers should be friendly, choose an individual approach towards every child and respect the individual qualities of every child.	3.5
2. Teachers should treat every child equally in all respects. It's fair.	3.1
3. Teachers should help children to resolve their tasks provided that children obtain new knowledge.	3.6
4. Teachers should be capable of predicting the style of children's learning management and adjust teaching according to that.	3
5. Teachers have to be an authority for children at all costs.	2.8
6. Teachers should be good friends to whom children can open their hearts anytime.	3.5

Questionnaire entries	Index
7. Teachers should be able to lower themselves to their children's level.	3.3
8. Teachers shouldn't be worried about speaking the majority of the time if in this way children gain a lot of knowledge.	2.2
9. Teachers deploy dialogue and discussion with children almost every day.	3.8
Teachers should teach exactly according to the curriculum.	2.3
Teachers should be able to promptly respond to emerging situations and adjust teaching to the current children's needs and preferences.	3.6
Teachers should prefer a child's individual work over children's cooperation in a group.	2.4

(Processed according to questionnaire answers Opinions of kindergarten teachers and students of pre-school pedagogy on good teaching in kindergartens)

In Table 3, indexes of entries related to the cognitivist approach are high. The index of the third entry is 3.6, which indicates that respondents think, they are children's assistants helping them to overcome their obstacles. Respondents express the positive degree of characterization in the seventh entry by an index of 3.3. They think they adapt their speech and thinking to children in their class, they can identify the level of children's development and, on that basis, implement development activities. The index of the ninth entry is particularly high, up to 3.8. Respondents answer that they try to find time for frequent discussions and dialogues with children during their lessons. The final index of all entries focusing on cognitivist learning theory is 3.5. This index is the highest one because the index of educational academism is 2.6 and that of educational humanism 3.2. According to these indexes, it is clear that teachers think they use cognitivist and humanistic approaches towards their children more than another approach.

Research findings focused on children and their activities

Table 4. Entries focused on children, their activities and indexes of responses

Questionnaire entry	Index
Children should be active during the education process in kindergarten and learn based on their activities.	3.4
Children should also experience situations when they accept knowledge from their teachers in a passive way.	2.8
Children should have the ability to choose activities they will participate in.	3.1
Children should receive new knowledge, skills or values by training.	2.9
Children should receive new knowledge mainly through experimenting and exploring.	3.3
Children in kindergarten should learn from their own mistakes.	2.8
Making a few mistakes as possible is the best way for children to learn.	2.1

(Processed according to questionnaire Opinions of kindergarten teachers and students of pre-school pedagogy on good teaching in kindergartens)

In table 4, entries related to cognitivist theory of learning and educational academism are presented. Some entries of educational academism are designed to express a feature of educational humanism in the case of a negative answer. Indexes of entries of educational cognitivism exceed the boundary point – 2.6 and thus the level of characterization is considered positive. Respondents think that children in their classes are active during the education process. The index of this entry is 3.4. The index of the fifteenth entry is 3.1 Techers try to offer more activities to choose from in order to participate only in activities they consider interesting. Entry no. 17 has a high index of characterization. The index of 3.3 indicates the respondents use the child's experimenting and exploring in the education process. The index of the eighteenth entry is 2.8. Based on the comparison of this index with the next one, it can be concluded that respondents do not avoid children's mistakes. These mistakes are perceived as tools that help children to learn. The summarizing

index of entries of educational academism is lower in this table, only 2.6, while the index of cognitivist theory is 3.15.

Research findings focused on the contents and goals of the education in kindergartens

Table 5. Entries focused on the contents and goals of the education process in kindergarten and their indexes

Questionnaire entry	Index
Practical skills related to daily life should be given priority over general contents in the education process.	3.6
Only the contents of the official curriculum (National Educational Programme) should be presented to children in the education process.	2.3
The contents should be adjusted according to children's individual needs in the education process.	3.2
The subject matter should be the same for all the children in the education process.	2.4
Children should not learn information but should learn about its meaning and the relationships between different pieces of the given information.	3.7
The goal of the education process should be, above all, fulfilling children's needs and supporting their self-development.	3
The goals of the education process should be based on certain standards and should lead to their precise fulfillment.	2.7
The goals of the education process should put greater emphasis on the cognitive side of children's development than on the emotional one.	2.3

(Processed according to questionnaire Opinions of kindergarten teachers and students of pre-school pedagogy on good teaching in kindergartens)

The last part of the questionnaire's entries focused on the contents and goals of education in kindergartens. The texts of entries and indexes of characterization are presented in table 5. The summarizing index of the academic theory is 2.4 and that of the humanistic theory is 3.1. The index of cognitivist theory is highest and its value is 3.2. The index of the twentieth entry is 3.6. Respondents

try to teach basic practical skills in kindergarten. Respondents think that children shouldn't only memorize content in their lessons, but they try to facilitate children to find the meaning of information and relationships between pieces of information they learn. The index of this entry is 3.7. The last entry that expresses the idea of cognitivism has an index of 2.3. This index didn't exceed the boundary point for agreement. Respondents think that emphasis should not be put on the cognitive side of children's personality rather than the emotional one in the education process. We believe, it is important to point out the fact, that cognitivist theory is primarily focused on cognitive aspects of education, but we have to add, the development of the emotional aspect of education is as important as the cognitive.

Discussion

The main aim of this partial research was to find out elements of some educational concepts in the use of the educational practice in kindergartens in Slovakia. Mainly, the elements of the cognitivist theory of learning were important to us to focus on. For our next research is significant, that teachers implement elements of the cognitivism in education process. These elements are combined with elements of humanism. A combination of these two approaches in kindergartens can be very helpful for children's adaptation in this modern world.

Using elements of these two approaches, their combination and using elements of cognitivist theory the most in practice, we consider as the first, progressive step in our next research and introducing an innovation in kindergartens. One of these important innovations is to implement the content of technical education in pre-primary education. This step we consider as necessary for today, fully informatized life. The idea of technical education is based on constructivist psychological theories we mentioned in the previous text. Cognitivist learning theory go hand in hand with technical education. Technical education is extremely important for shaping work habits and improving the ability to adapt to rapid changes in society and technology. On the other hand, children

have to learn how to stay empathetic, emancipated and humanistic in today's world, which is fully globalized and economized. Also, the introduction of technical education content is important because of the inclusion of technical literacy in the system of lifelong learning (Kožuchová – Pomšár – Kožuch, 1997).

In the beginning, we establish several hypotheses. As we implicitly indicated, our hypotheses have been confirmed. Now, we explain specific hypotheses. Hypothesis no. 1, in which we assume that respondents prefer the cognitivist approach more than humanistic, is confirmed. Indeed, according to our respondents, they really try to use the cognitivist approach. They try to be the facilitators of child learning. Hypothesis no. 2 is confirmed according to our data. Confirmation of this hypothesis is very beneficial in the context of technical education, because respondents try to implement experiments in their education, and according to Ďuriš (2007), the experiment is one of the methods of technical education. Based on the answers of our respondents, we consider hypothesis no. 3 as confirmed. Respondents try to use dialogues and interviews with children more than their monologue method most time. The use of dialogue is one of the elements of cognitivism and technical education, too. Hypothesis no. 4 is also confirmed according to our collected data. Answers show that they try to teach content which is focused on skills of everyday life need more than content, which is based on general knowledge.

We have to highlight, that these results are important in the context of the introduction of technical education, which in many ways uses elements of t cognitivist learning theory, but elements of the humanistic concept are very important, mainly for a child's emotional development. Although, the academic educational concept had the lowest indexes of characterization, we are not disparaging this concept. Some of its elements are important for the child's development.

The importance of technical education is also increasing due to compulsory preschool education, which is going to be introduced in 2021 in Slovakia.

Limits

For proposing and introducing innovations in education, we need to know the current status. It should be noted, it is not possible to achieve holistic results based on of one method standing alone when we focus on examination this very broad issue like this one. We can find more methods that could be used to investigate this issue, in both qualitative and quantitative research design. These existing information we could complete by an observation method. We could observe the practical use of these concepts in practice directly. After observation, we consider an interview as necessary. We could investigate the reasons for using elements of educational concepts. The examination of the issue in the context of technical education, it is necessary to supplement the data we have obtained already with a next questionnaire, which would focus on technical education, its methods, forms and their use in the practice of kindergartens.

We want to note, this research is an input to the holistic issue of technical education in kindergartens, primary schools and its continuity. At first, in this research, we tried to find out which methods teachers use in education (or which concept they prefer), which are compatible with methods of technical education. We are fully aware that it is not possible to create a complete picture of the issue based on the respondents' participation in this research. The research was used as a mapping of the use of elements of educational concepts. For a coherent picture of the research results, a much larger sample of respondents is needed. We are also aware, the level of education, length of practice, location of kindergarten and many other factors play an important role in respondents’ responses. Even the questionnaire was anonymous, we are aware that there is a possibility that respondents did not respond honestly or they choose answers, which they find as socially wanted.

Conclusions

Despite the limitations of this research, the gained data are beneficial for our next research. We find out that teachers in Slovakia use some elements of the cognitivist learning theory in the education process. Based on the humanistic concept index of characterization, we can say that cognitivist and humanistic approaches are used mostly and used in combination.

These findings are important, especially, in the context of the idea of technical education, which uses some elements of the cognitivist learning theory. The use of some of these elements by teachers is a positive signal for introducing the technical education content in all levels of the Slovak education system in general and it encourages us to continue with research, which is going to be more specific, focused on technical education in the primary level of education.

During the study of this issue, we have found any research focused directly or indirectly on educational methods or approaches in kindergarten, except for one research, which was focused on the Slovak education system in general. This broad research has been carried out from 2017 until 2019 and it still continues. This research has been focused on the Analysis of the education system in Slovakia and has been carried out by a team of analysts LEARNING MAKES SENSE. The research has been focused on the education system in all levels of education, from kindergartens to colleges and universities. In the context of kindergarten research, there were 2731 respondents. In this part, there appears data about methods and content of education in kindergarten. The used questionnaire contains entry focused on methods of education, in which respondents have to mark 6 answers from several options. This collected data show, and support our research. We choose answers, which are relevant the most in the context of our research. The research of the team LEARNING MAKES SENSE, shows that 37.4% of their respondents use the research method in their practice and 49% of their respondents use the experimentation method (for more information see also: (https://en.todarozum.sk/).

All of the other research we have found are focused on using methods at the primary level of education or higher education. We

present some examples of some of them. Skutil (2015) focused on the comparison of methods of education at the primary level in the Czech Republic and Spain. 15 primary school teachers from the Czech Republic and 15 from Spain responded in this research (see Skutil, 2015). Skutil's, Havlíčková's and Matějíčková's (2016) research was focused on education methods at primary schools in the Czech Republic. 42 teachers participated in this research. It shows that presentation, demonstration, narrative method and group teaching are used the most. S. Ivić (2016) describes education methods in Croatia according to her research, in which 156 primary teachers were participated. In Croatia, primary school teachers use a narrative method, homework method, individual forms of education and frontal education. Research of Birgili, Kiziltepe and Seggie (2016) from Turkey we see as interesting, too. They point out that primary school teachers in Turkey prefer direct instruction teaching the most. The second, teachers prefer cooperative learning, group work and at last they use the question-answer method.

However, we have found some publications dealing with activating or modern methods of education. We choose to present some of them, which can be used in kindergarten practice. Vijayalakshmi (2019) mentions cooperative learning, brainstorming and mind mapping. He highlights ICT-using methods. Vijayalakshmi and Phil (2019) as innovative methods include discussion, projects, solving problem method or experimentation.

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