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Prevention of Children's Adaptation Difficulties in Primary Education through early Stimulation of School Readiness

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Abstract

The presented article is devoted to the issue of preventing adaptation difficulties of beginning schoolchildren by strengthening school readiness at the end of pre-primary education in kindergarten and in elementary school. Specifically, it concerns the stimulation of universal learning prerequisites, which are considered by experts to be one of the essential determinants of initial learning. With this intention, our own set of activities was developed, which is oriented towards optimizing the conditions in the transition period and developing the learning prerequisites of children for school education. In order to verify their effectiveness, a pedagogical experiment was carried out at selected primary schools in Slovakia. The experiment confirmed that the proposed set of activities had a statistically significant effect on the level of learning prerequisites of children at the beginning of schooling. We can consider the strengthening of individual areas (e.g. memory, school motivation, planning, understanding of instructions, etc.) as one of the important components of preparing children for a successful start to school and preventing adaptation difficulties.

Keywords: transition period, kindergarten, initial learning, school readiness, components of school readiness, adaptation difficulties, prevention, learning prerequisites

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1. Introduction

Providing timely care and education to children from birth to the start of compulsory school attendance is an important part of preventing their developmental delay as well as school immaturity. In 2022, the National Strategy for the Development of Coordinated Early Intervention and Early Care Services 2022–2030 was adopted in Slovakia. One of the long-term goals of this strategy is the creation of a system of multi-level support for the optimal development of children and the elimination of inequalities between them in accordance with their current health, development and social needs. The proposed system of interdepartmental cooperation is intended to ensure adequate conditions for supporting the complex development and social inclusion of children through the so-called universal interventions that create an inclusive environment in healthcare, education and the social sphere.

Part of the above-mentioned goals in the field of education is also the creation of conditions to support school readiness and the smooth transition of children from kindergarten and family to elementary school. This transition represents a significant change in a child's life with an impact on his/her academic and personal development (Gonzalez-Moreira et al., 2023; Bakopoulou, 2022; Tokic, Borovac 2020; Viskovic, Višnjić-Jevtić, 2020). Prevention or elimination of difficulties faced by some children when entering primary school requires targeted and effective cooperation between the family and school environment in an effort to saturate their individual needs (Tobin et al., 2022; Packer et al. 2020). First of all, it concerns their readiness for the tasks of school education, but also the readiness of schools and teachers to support children of diverse groups in gradual adaptation to new conditions. A significant role in this is played by the targeted preparation for the future position of the schoolchild at the end of pre-primary education in kindergarten and in the family, when attention gradually shifts from play to work with structured activities led by adults (Wildres, Wood, 2023). The content of these activities is the gradual familiarization of future schoolchildren with new perspectives of school education. It also includes the stimulation of prerequisites for future learning activities, which gradually become the main activity of the beginning pupil.

Research show that early support already in kindergarten is one of the determinants of a successful transition to elementary school and a student's academic success (Quenzer-Alfred et al., 2020). Similarly (e.g. Gagay, Grineva, 2015, Dockett et al., 2011; Lillejord et al., 2015, Urbina-Garcia, 2020; Supporting successful..., 2020) emphasize the positive impact of stimulating a child's cognitive, social and psychomotor skills before entering primary school. A child's lack of readiness for new changes is one of the most frequently cited causes of problematic adaptation (Hurrelman, Bründel, 2003; Martin, 2013 and others). We consider the support of children's readiness for schooling to be one of the effective strategies for a smooth transition to the next level of education and the prevention or elimination of adaptation difficulties. This means implementing concrete measures aimed at preventing undesirable phenomena in our case of adaptation difficulties.

According to E. Leonov et al. (2014), insufficient development of universal learning prerequisites, as one of the components of school readiness, is identified as one of the fundamental causes of students' academic failure and problematic adaptation to school. The aim of this study is to verify the effectiveness of a set of activities focused on stimulating learning prerequisites in children during the transitional period between pre-primary and primary education.

Review of the literature

Currently, a holistic approach to the issue of school readiness, which looks at this phenomenon from the point of view of the child's individual competencies, is being emphasized. They are part of the developing personality of the future schoolchild - emotional-value, content-active and control-regulatory competences (Zhao, 2017). The unifying beginning of all components of the future pupils´ personal readiness is the awareness and emotional experience of their growing "maturity", which manifests itself in independence and a focus on a new social position, i.e., in the center of the future pupil´s perception is the emerging subjective position in activity, communication and learning.

A similar concept is shared by E. Leonova et al. (2014), which emphasizes the importance of personal competence as an integral characteristic of the future schoolchild's personality. Its structure consists of: an individual-psychological component (personality specifics, its individuality, e.g. the child's self-evaluation), an intellectual component (the level of the child's intellectual abilities and knowledge), a motivational-value component (school motivation – relation to knowledge, curiosity,

etc.), communicative component (the ability to establish contact with peers and adults) and the activity component - a certain level of universal learning activities (prerequisites for learning, e.g. the ability to understand and accept the teacher's instructions, to plan the course of activities (3-5 procedures), to be able to perform self-control in accordance with specified procedures, prerequisites for self-evaluation according to specified criteria) (Figure 1). Nevertheless, in pedagogical practice, the abilities of future schoolchildren to acquire the basics of literacy in primary education (reading, writing, mathematical skills, etc.) are dominantly developed.

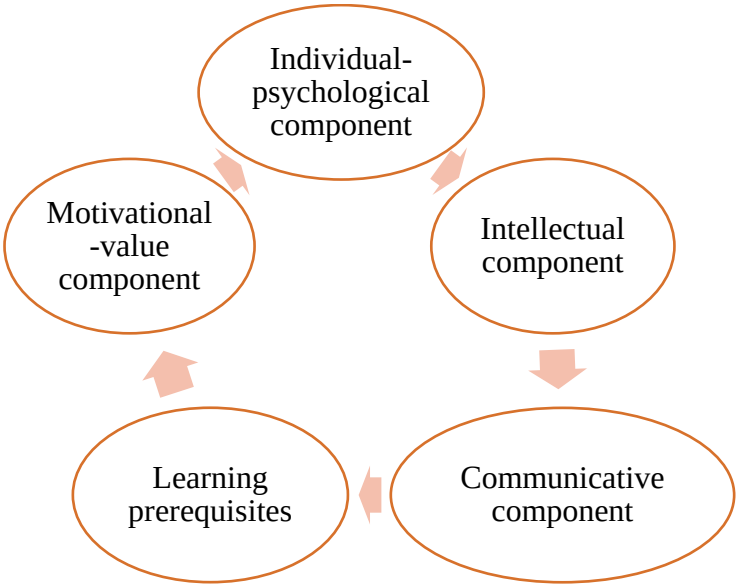

Fig. 1. Concept E. Leonova et al. (2014)

Even though the positive impact of children's school readiness before starting compulsory school attendance on their academic and personal development is confirmed, professional discussions about its validity continue. On the one hand, we can observe tendencies that emphasize the need for children's pre-specified academic and social skills. On the other hand, some authors emphasize the policy of inclusive education with an emphasis on the readiness of the school to create an environment in accordance with the diverse individual educational requirements of children (Petriwskij, 2010). This approach extends and questions the concepts of readiness, which emphasize a narrow focus on pre-specific sets of skills, individual performance tasks and testing (Falchi, Friedman, 2015).

Another issue is the establishment of indicators of children's school readiness, which would enable those involved to orientate themselves at their level and take appropriate intervention measures in time. A lot of researches confirm that primary and kindergarten teachers, including parents of future/starting school children, often have different views on children, their learning process and the role of the teacher (Einarsdóttir, 2018; Fabian, Dunlop, 2007). Kindergarten teachers in many cases consider other aspects of school competence to be important and prioritize them than teachers in the 1st grade. Some experts (Hansen, 2012) are critical of the insufficient theoretical and practical understanding of the structure of children's school readiness as well as the focus of preventive measures and practical solutions to emerging adaptation difficulties at the threshold of school attendance.

If we start from the theory of the overall development of the child's personality, the main indicator of the personality readiness of the future schoolchild is the forming subjective position in activities, communication and cognition. Its essence consists of initial key competencies. A child with a high level of initial competence is able to independently solve tasks aimed at protecting his/her health, to carry out diverse types of activities (play, productive, learning-exploratory, communicative, etc.), to cooperate with adults and peers. It also includes developing ideas about oneself, the intentionality of cognitive processes, etc. (Brocki, Bohlin, 2004). Initial key competences are indicators of school readiness and a starting point for the preparation of future schoolchildren in kindergarten with the aim of leveling their starting abilities when transitioning to school, humanizing initial teaching (the concept of child well-being) and creating a unified training system.

In our article, we focused more closely on the activity component of personal readiness – on universal learning skills. The child develops learning skills gradually in initial teaching in joint activities with the teacher, but the prerequisites for them are already formed in preschool age. The point is that the learning activity, which becomes the main activity after the child starts school, presupposes, among other things, his/her readiness for a subjective position in this activity. The subjective position is understood as the sum of such abilities as e.g., social activity of the child, which is aimed at acquiring and expanding certain knowledge and the ability to apply it in practical activities, a certain level of cognitive interests, a focus on independent, creative work, achieving good academic results, etc. The ability to work according to a certain pattern, the ability to listen to and complete the instruction of an adult, to control one's activity, to be able to evaluate one's own work and the work of others according to specified criteria can be included among other learning skills of a beginning schoolchild (Garon, 2008).

For some children, as a result of the increased burden caused by the changes related to starting school, the problematic integration into the unfamiliar environment and the emergence of adaptation difficulties might occur (Borbélyová, 2020). The causes relate to both endogenous factors (Crepaldi Santos et al., 2017) and exogenous factors associated with the family, preschool and school environment (Rimm-Kaufman, Pianta, 2000; Boethel, 2004; Marturano, 2008; Akcinar, 2013). One of the most frequently cited causes of problematic adaptation is the insufficient level of comprehensive readiness for school (Hurrelman, Bründel, 2003; Denham, 2006). An insufficiently developed level of readiness, including the educational prerequisites emphasized by us, can be a serious obstacle in the gradual identification of the child with the role of a schoolchild, as a result of which the process of adaptation takes on a problematic character.

The results of experiments, e.g., also prove this (Józsa et al., 2023). According to the authors, the riskiest area in adapting to school was the students' intellectual passivity. Here, teachers recorded serious symptoms that indicated potential problems in this area. 25 children (23.58 %) did not know how to navigate the tasks, did not know how to perform the task according to the teacher's instructions. Furthermore, it was observed that 35 students (33.01 %) often did not answer essential things, could not capture the essence. 38 pupils (35.84 %) had difficulty understanding the teacher's instructions, they did not understand various concepts. From the above, it can be deduced that the students did not have sufficiently developed learning habits.

Singer, Bashir (1999) confirm that one of the main causes of school failure of pupils is insufficiently developed executive functions, which represent a set of higher cognitive processes. Through them, the individual can regulate his/her behavior (flexible goal-oriented behavior such as activation – the ability to complete tasks, adequate ability to concentrate, direct attention to task performance, working memory, adequate management of frustration and control of emotions, ability to self-regulate one's behavior, etc.).

Effective preventive measures include preparing the future schoolchild to accept a new role, the result of which is his/her school readiness. Prerequisites for the above-mentioned abilities are created throughout the child's stay in kindergarten. Targeted preparation for their development is mainly implemented at the end of pre-primary education in the class of the oldest children – future schoolchildren through purposefully directed activities under the guidance of the teacher. The new quality of their development continues in school education. Deliberately directed activities are considered the beginning of a child's intellectual work, through which his interest and need to learn about the world and discover new facts is formed. The child gradually learns to set a goal, to choose adequate means, to be aware of the work progress and, above all, to achieve a certain result. It is important that the teacher's cooperation with "preschoolers" is carried out in the spirit of partnership. The teacher acts as a partner who establishes contact with the child, but also with the object of their joint activity, which he plans, manages, coordinates, and analyzes. In the process of partnership common activity, there is a constant exchange of information, relationships, and activities between participants. It is important that the participants in the joint activity are comfortable, and that the child's needs are met, aimed at cooperation with an adult (Zakharova, 2022).

When creating our own proposal for preparing children for their future role, we were mainly based on the "concept of the future" (Lago, 2014). Focusing on the future already at the end of pre-primary education represents the child's gradual orientation towards accepting the new social role of pupil and classmate – i.e., adequate preparation for related changes (physical environment, social contacts, learning activities, etc.). The author (2014) places more emphasis on the "after" dimension than on the "before", i.e., involved sides have realistic ideas about the future in primary

school. The educational process is oriented towards the perspective of the future position of children and the resulting learning activity at school as something attractive and desirable.

The transition itself means the end of one part, or level of education and the beginning of the next part of the educational process. The introduction of school education includes a gradual familiarization with the school environment, within which support is needed in the pupil's orientation in new conditions. It also includes longer-term monitoring of the child's progress and the provision of necessary support based on identified stimuli (The transition..., 2001). There is a mutual connection between the individual stages, and the quality of the previous stage determines the quality of the next one.

The theoretical framework of the issue and the research findings so far represented a starting point for conducting pedagogical research, the aim of which was to verify the effectiveness of the set of activities proposed by us at the level of learning prerequisites at the beginning of schooling.

We set a research problem for the research activity: *What is the impact of a set of activities on the level of learning prerequisites of children?*

Subsequently, we defined the research hypothesis H1: The set of activities that we designed has the potential to increase the level of children's learning prerequisites.

Characteristics of the set of activities and methodology of working with it

The set that we compiled contains 10 activities that are aimed at supporting the learning prerequisites of future and beginning schoolchildren, with the aim of reducing their adaptation difficulties. The set of activities is divided into three parts according to target groups and implementation environment. The first part consists of activities aimed at strengthening the learning prerequisites of future schoolchildren in kindergarten. The second part is intended for families with children, the implementation of which is limited to the summer vacation period. The third part is concretized by a set of activities for beginning schoolchildren after entering the 1st year of elementary school. Activities in the individual parts of the compiled set can be carried out separately or in blocks.

The proposed set is primarily aimed at developing children's ability to understand the teacher's instructions, to plan their activities in accordance with the given instruction from the teacher, to create an idea of the result. Secondary, the set is aimed at the development of self-control and self-evaluation of children according to established criteria. The development of the mentioned skills prepares the child for a subjective position in future learning activities, which is an important and determining part of school readiness.

The implementation of a set of activities took place in individual months and institutions:

– May-June (kindergarten and family),

– July-August (family),

– September-October (primary school and family).

Due to the scope of the article, we present only a brief description of the set of proposed activities. In the kindergarten, under the guidance of a trained teacher, a set of four activities was implemented:

– WHAT IF

Objective: To create an idea of expected behavior in selected school situations with an emphasis on self-regulation of behavior.

Aids: pictures depicting school situations (accepting help and praise from a classmate, asking for help, apologizing, cursing, lying, making fun of a classmate)

Implementation: The teacher has prepared pictures with different forms of behavior, e.g., accepting help and praise from a classmate, asking for help, apologizing, asking for advice. The pictures also show inappropriate behavior and situations from school life – cursing, lying, making fun of a classmate, negative evaluation, acceptance of success and failure. He conducts a conversation with the children about the consequences of given situations, about the advantages and disadvantages of the solutions proposed by them.

Output: After mutual conversations with the children and evaluation of selected situations, the children develop ideas about appropriate and inappropriate behavior in the school environment, and their consequences. At the same time, they strengthen their ability to self-regulate.

– DICE

Objective: To apply mental effort in the analysis and comparison of selected subjects from the school environment.

Aids: some dice with pictures of school tools (pencil, scissors, notebook, school bag, pencil case, ruler) (Figure 2).

Fig. 2. Dice with pictures of school tools

Implementation: The teacher demonstrates some dice with pictures. The children's task is to identify school supplies in pictures, verbally describe their use and the necessity for learning at school. Children roll the dice in the specified order and complete other items necessary for the implementation of learning activities. Together with the teacher, they determine different and common features, name objects with superior terms and look for mutual connections between them. When throwing the same object, they have to come up with other possibilities for its alternative use at school.

Outcome: Based on their own experiences and ideas, children improve the mental operations of analysis and comparison.

– DRAWING ACCORDING TO THE INSTRUCTIONS

Objective: To strengthen the ability to understand the given instructions.

Aids: any picture, an album of pictures showing the progress of the activity

Implementation: The teacher divides the children into groups with the same number of members. Each group realizes a different activity. One group draws a picture according to the teacher's verbal instructions. The second group works according to the pictorial procedure. By mutual agreement, the members in the third group draw one common picture. After finishing the activity, the groups take turns. The created image in the third group will be used to formulate drawing instructions in the first group. Within a certain time limit, all the groups will take turns.

Output: The teacher conducts a conversation about the importance of understanding instructions in school education, children create ideas about the potential consequences and causes of not understanding instructions.

– USE OF ITEMS

Objective: To improve the ability to cooperate in a group.

Aids: any objects from the school environment

Implementation: The teacher divides the children into groups with the same number of members. In the formed groups, the children choose the objects that are hidden under the blanket. Together they invent a situation from the school environment in which they will use the selected subjects. Subsequently, they dramatize the given situation in groups. All groups have the same time and the same number of aids for preparation. At the end, both the children and the teacher give feedback on the preparation of the dramatization, the use of objects and the cooperation in the group.

Outcome: Children strengthen their skills in cooperation with other members of the group.

The continuation was the implementation of two activities in the child's family environment during the summer holidays:

– TO SCHOOL – board game

Objective: To strengthen the ability to follow the sequence of steps in solving tasks.

Aids: game plan (Figure 3), dice with numbers.

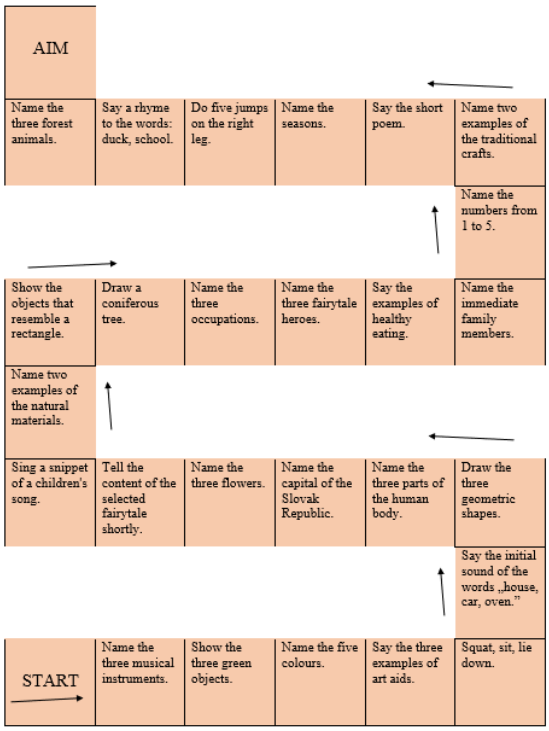

Fig. 3. Game plan

Implementation: The basic element of the activity is the game plan - a path on which there are various tasks. In the specified order, the child rolls some dice with numbers. The parent reads the instruction. The instructions follow from the content of pre-primary education, e.g., name three musical instruments, say the initial sound of words, draw geometric figures, give examples of healthy food, do five jumps on the right leg, sing a song excerpt, etc. After completing the task, the child moves the number of squares thrown on the game board towards the goal.

Outcome: Children are led to improve their ability to understand instructions.

– WHAT WILL I BRING?

Objective: To strengthen the ability to remember the instruction for the activity.

Aids: board (Figure 4).

	colour	1	2	3	4	5
A	blue	art aid	clothes	sports aid	toy	bathroom object
B	yellow	sports aid	favourite object	school aid	clothes	decoration
C	green	clothes	decoration	school aid	art aid	sports aid
D	red	decoration	clothes	sports aid	favourite object	school aid
E	black	shoes	school aid	kitchen object	furniture	clothes
F	white	furniture	bathroom object	art aid	toy	food

Fig. 4. Board

Implementation: The parent formulates the instruction according to the orientation on the board, i.e., combination of color and object (e.g., blue art tool). The child must remember the

instruction. His/her task is to find and bring the object according to the instructions based on the prepared chart. In the rows there is a color (blue, yellow, green, red, black, white) and in the columns there are objects (clothing, art aid, sports aid, decoration, toy, etc.). A parent can gradually formulate several instructions at once.

Output: The child improves in understanding the instructions and especially in memorizing them. The difficulty increases with the number of instructions.

The third stage began after the children entered the 1st year of primary school, where they continued to implement four activities:

– WHAT THE PUPIL NEEDS FOR SCHOOL

Objective: To strengthen the ability to plan an activity and create ideas about its outcome.

Aids: information resources, art supplies

Implementation: At the beginning of the activity, the teacher asks the question: "What does the pupil need for school?" and talks to the children about their ideas.

The implementation of the activity takes place using the DICVR method according to the authors Zelina & Zelinová (2011) (define, inform, create, verify, implement).

In groups, children think about what a pupil needs for school education:

D-define – together they clarify the importance of school needs for the learning of a pupil in the 1st year of elementary school.

I-inform – children work in groups, look at various encyclopedias, books, newspapers, and with the help of the teacher they can use the Internet.

C-creature. In this part of the activity, they create a set of things that the pupil needs for school. They can draw them or write according to individual assumptions.

V-verify. The created lists of individual groups are compared and evaluated according to criteria – financial costs, necessity, durability, etc. Based on the evaluations, they will select the best list of things, or create a common set of subjects for the needs of school learning.

R-realize. The children will use the processed designs when creating a picture package of school supplies. They individually draw a specific thing from the list on a separate piece of paper. They collect all the pictures in an envelope as an answer to the question of the future pupil.

At the end, they compare the set of images with their aids.

Output: In children, the ability to plan an activity and create ideas about its outcome is dominantly developed. In the activity, the ability to concentrate and to motivate the activity are also improved.

– CONCEPT MAP – LEARNING

Goal: To deepen school motivation and emotional experience of the role of a pupil.

Aids: none

Implementation: In a common conversation with the teacher, children express their ideas, knowledge and experiences with the term "learning". Recommended questions are: "What are you most looking forward to at school? Which subjects are the most interesting?, What are you worried about while learning?, What have you already learned?". Subsequently, children in groups create a concept map that will contain their answers in mutual contexts.

Output: Children's cognitive motives for learning activities are strengthened, the level of school motivation and adequate emotional experience of the role of a pupil is increased.

– THE WAY TO SCHOOL

Objective: To strengthen the ability to complete the activity.

Aids: construction set, twine

Implementation: The teacher divides the children into groups with the same number of members. Children will create a school environment from the kit, which includes various objects, e.g., shop, bank, post office, bus stop, etc. They will place the completed structures on an open area (carpet, connected school desks). The task of the individual will be to create a path using twine. The teacher determines the beginning and end of the path, e.g., from the school to the post office. Children also propose and implement their own solutions to a given situation. In the activity, everyone takes turns with their own assignment. The difficulty of the task can be increased by setting restrictions on creating a path, e.g., the shortest option. At the end of the activity, they individually draw a map of the way from their residence to the school with a display of dominant objects.

Output: Children improve in completing the activity.

– CONTEXT

Goal: To strengthen the ability to concentrate in activities.

Aids: an album of pictures with school supplies

Implementation: Children look at an album of pictures prepared by the teacher, which show school supplies. Each child will have their chosen picture pinned to their back. His task is to find a teammate with the same picture. Searching for pairs takes place only through non-verbal communication. After finishing the activity, they will evaluate the correctness of forming pairs.

Variation: Individuals can recognize their own image and form groups according to established criteria, e.g., the group was to be created by everyone who had pictures of school supplies, school furniture, people from school, etc.

Outcome: The child practices the ability to concentrate and pay attention.

2. Materials and methods

The formation of universal learning activities is one of the determinants of adopting the role of a schoolchild and successfully managing the resulting changes (dominance of learning activities instead of play, compulsory homework, replacing spontaneous activities with controlled tasks). Even if they are gradually created in primary education, some skills must be developed already in pre-primary education, e.g., understand and accept the teacher's instructions, plan activities, do a self-check in accordance with the specified procedures and self-evaluation according to the specified criteria. (Goleman, D. In: Bednárová, Šmardová, 2012).

Characteristics of the research sample

The research was conducted in two kindergartens and two primary schools. For the purposes of the study, the selection was carried out using convenience sampling. The subsequent criterion for the purposive selection of research subjects was that the child attended a selected kindergarten as a future first-grade pupil and then entered the first grade at a selected primary school. In each institution, two classes of future first-grade pupils in the kindergarten and subsequently two classes of beginning first-grade pupils in the primary school were selected. The research sample consisted of 85 respondents aged 5-7 years, who were randomly divided into an experimental group (44 respondents) and a control group (41 respondents).

Individual groups (experimental and control) worked in the same time intervals and in similar material conditions. The set of activities became part of the educational process of the experimental group as a determined experimental variable. The educational process of the respondents of the control group took place as standard, without any intervention from the researchers. With the respondents of the experimental group, the activities of the 1st part of the set of activities were carried out in kindergarten, then the 2nd part of the activities was presented to the parents, and at the beginning of school attendance they continued with the application of the 3rd part.

Research progress and methods of obtaining new data.

In accordance with the ethical principles of research, the principals of selected kindergartens and elementary schools were asked to carry out the research activity, and we informed them about our research intentions. After the approval of the school management, instructional meetings were held with the teachers who worked with the experimental group of children and pupils. The legal representatives of the children expressed their consent to the research activity by signing the informed consent.

The application of a set of activities in the oldest age group (6-year-olds) of kindergarten began with enrollment in primary school, when contact with parents and "soft" diagnosis of the level of development of the future schoolchild was ensured (in our conditions, it is in the month of April). The first stage of the work represented the implementation of an entry measurement (pretest), the purpose of which was to determine the initial level of learning prerequisites of all children in the research sample. Subsequently, the interested parties (kindergarten teachers, future schoolchildren and their parents) participated in the implementation of activities according to the prepared content and scope. The trained teacher gradually included the activities and carried them out with the students in the teaching process. Due to the local context, some activities were also carried out in the summer months during the school holidays (July, August). This process also included methodical activities for teachers and advisory activities for parents to work with a set of activities. After the implementation of the activities, the output measurement (posttest) was carried out. The intention was to verify the effectiveness of the set of activities designed by us at the level of learning prerequisites at the beginning of school attendance.

As part of a natural (field) experiment, we chose a questionnaire from a number of exploratory methods as the main method of registration and data collection, which was used to map the level of learning prerequisites of each child. His/her choice corresponded to the characteristics of the learning prerequisites, the research sample, the established research purpose (research problem, research goal, verification of hypotheses) and the conditions of pedagogical practice.

To determine the level of learning prerequisites (pretest and posttest), we chose the Childhood Executive Functioning Inventory questionnaire. The original research instrument used was created by Thorell & Nyberg (2008). It serves for teachers to measure the performance functioning (interplay of the organization of activities and thinking) of children from 4 to 12 years of age. Individual questions related to partial cognitive functions necessary for the implementation of future learning activities, e.g., the ability to remember, the ability to elementary plan and complete an activity, understanding instructions, knowing the sequence of steps to solve a task, etc.

The modified questionnaire contained 24 questions, which were divided into several areas revealing the level of partial cognitive functions, i.e., the child's prerequisites for carrying out learning activities at school. The first area of questions concerned working memory, the level of ability to remember information (e.g., “Does he have difficulty remembering long instructions?”; “When asked to do several things, does he remember only the first or the last?”). In the second area, the formation of the skill of elementary activity planning was investigated (e.g., Does he have difficulty planning an activity?", Does he tend to do things without first thinking about what might happen?"). A group of questions in the third area monitored the level of concentration and understanding of instructions (e.g., "Does he have difficulty understanding verbal instructions without visual demonstration?"; "When something needs to be done, is he often distracted by something more interesting?"). The questions of the fourth area concerned the child's activation, organizing tasks, setting priorities and mastering the sequence of steps in solving a task (e.g., "Does he have difficulty with tasks or activities that involve multiple steps?"; "Does he have difficulty thinking ahead or learning from experience?") . The fifth area of questions involves emotionality, the appropriate expression of emotions (e.g., “Does he have difficulty holding back laughter in inappropriate situations? “Does he get overly excited when something special is going to happen?”). In the last area, the level of monitoring, self-regulation in the activity and the ability to finish the activity were determined (e.g., "Does he have difficulty finishing the activity despite the challenge?").

The questionnaire was filled in as follows. If the teacher observed a certain behavior in the child that was characterized by the given question, he/she assigned the child an answer on the scale: completely false (1), false (2), partially true (3), true (4), completely true (5) . The maximum number of points was 120 points. Based on the total number of points, the level of learning prerequisites for each child was examined. Achieving a higher total of points in the questionnaire meant potential difficulties in the implementation of learning activities, i.e., a lower level of performance functioning of the child.

An interview was also used as the research method, which was conducted by teachers of kindergarten, 1st year of elementary school and parents of respondents of the experimental group. We conducted the interview after completing the application of individual parts of the set of activities and after evaluating the questionnaires. The data obtained from the interviews gave us the opportunity to gain a deeper understanding of the various levels of effectiveness of individual activities. For the research activity, we chose a semi-structured interview, the content of which was focused on the positives and negatives of the activities carried out. Other questions arose continuously, related to other contexts according to the content of the teachers' and parents' answers. The interview resulted in answers that we continuously recorded, then transcribed and analyzed.

Data analysis

We tested both in the pre-test and in the post-test

H_0: There is no difference in the level of learning prerequisites between the control and experimental groups,

against

H1: There is a difference in the level of learning prerequisites between the control and experimental groups.

A) Analysis of pre-test results

The aim of the pre-test was to determine the initial level of learning prerequisites of children in the experimental and control groups. The sum of the points in the entry questionnaire was

calculated for each respondent of the control and experimental groups. In each group, the average values were then determined from the total points and the total differences in the level of learning prerequisites were compared. The average number of points was 68 points in the experimental group, 69 points in the control group. In the next step of the pre-test analysis, we tested whether the detected differences in CG and EXG are statistically significant.

According to the results of the Shapiro-Wilk test (Markechová et al., 2011), we cannot consider the distribution of values in individual groups to be normal. Therefore, to verify whether the differences are statistically significant, we used the non-parametric Wilcoxon two-sample non-parametric statistical method. After entering the results of the pretest into the STATISTICS 10 program, we obtained the value of the test criterion Z = 0.688 and p-value = 0.492 in the computer output. The calculated p-value is a large number ($p > 0.05$) we cannot reject the tested hypothesis H_0. The differences between the control and experimental groups in the results obtained in the pre-test are not significant, i.e., there is no statistically significant difference in the level of learning prerequisites between the experimental and control groups. Based on the test, we consider both groups to be equivalent.

B) Post-test analysis

In the post-test, the respondents of the experimental group scored an average of 44 points and the respondents of the control group scored an average of 63.5 points. As in the pre-test as well as in the post-test, we tested the statistical significance of the detected differences between EXG and CG.

Based on the results of the Shapiro-Wilk test (Markechová et al., 2011), we cannot consider the distribution of values in the individual groups to be normal even in the post-test. Therefore, to verify whether the differences are statistically significant, we again used the non-parametric Wilcoxon two-sample non-parametric statistical method.

After entering the results of the post-test, we obtained the value of the test criterion Z = 7.878 and the p-value =0.0001 in the output report of the computer. p- value is a small number, ($p < 0.05$) so we can reject the tested hypothesis H_0. The differences between the experimental and control groups according to the results obtained in the posttest are statistically significant. Based on the differences between the experimental and control groups in the post-test results, we can state that the respondents of the experimental group achieved a statistically significantly higher level of learning prerequisites compared to the respondents of the control group. Therefore, we can consider the proposed set of activities to be effective.

A comparison of the results of the experimental and control groups in the input (pretest) and output (posttest) is shown in Figure 5.

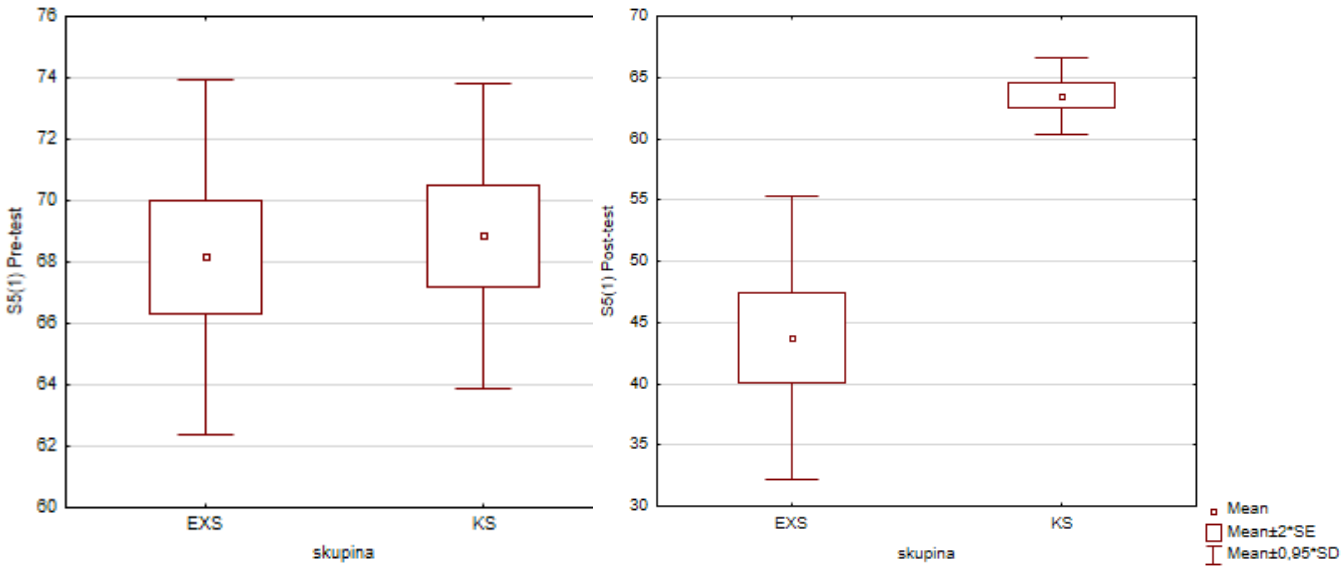

Fig. 5. Comparison of average values between the experimental and control groups in the input (pretest) and output (posttest) measurements

C) Analysis of the effectiveness of activities in individual areas of learning prerequisites

Each of the proposed activities was created in such a way as to specifically develop one of the sub-areas of the children's learning prerequisites. Therefore, the next step of the data analysis was to verify the extent to which the activity develops the area for which it is intended for development. We did this verification in two stages. First, we used the χ^2-test of independence for the $k \times m$ contingency table to verify whether the pupil in the monitored area (Memory, Planning, ...) depends on whether it is the results of the pupil of the experimental group in the pre-test or in the post-test. The calculated values of the test statistics are in table 1. The mentioned test proved (on the basis of the calculated p-value) that there is a connection between the child's results in the pre-test and the post-test in all monitored areas of learning prerequisites. Based on the established relationship, we conclude that the activities are well set, and the higher level of learning prerequisites found in the post-test is a consequence of their application in EXG.

In the next step of the effectiveness analysis of the activities, we calculated the degree of dependence between the children's results in the pre-test and post-test for individual areas of learning prerequisites using the contingency coefficient. The calculated contingency coefficients are in Table 1.

Table 1. Contingency coefficients

Area of learning prerequisites	Pearson Chi-square	Contingency Coefficient C
Memory	30.82	0.5013
Planning	27.709	0.5093
Metacognitive skills	21.011	0.3986
Concentration	26.401	0.4804
Understanding instructions	29.985	0.4844
Sequence of steps	21.054	0.4394
Emotions, school motivation	39.586	0.557
Self regulation	22.094	0.4709
Task completion	12.927	0.3579
Cooperation	21.387	0.4324

Based on the calculated contingency coefficients (Table 1), we note that a moderate to significant degree of connection was identified between the child's results in pre-test and post-test, i.e., the activities created by us developed all monitored areas of learning prerequisites, but not equally.

Table 1 shows that in the areas of "Memory", "Planning" and "Emotions, school motivation" a significant degree of connection was found between the child's results in the pre-test and post-test. Figure X illustrates the change in the distribution of the frequency of points in the area "Emotions, school motivation", where the highest value of the contingency coefficient was calculated (Figure 6).

We interpret this finding as confirmation of the correct setting of the "Dice" and "Road to School" activities, the primary goal of which was to develop these three areas of the child's learning prerequisites. On the contrary, the lowest degree of attachment was found in the areas of "Metacognitive skills" and "Completion of the task", which we interpret as revealing the need to modify the activities "The Cube" and "The Road to School", which were primarily aimed at developing these areas of learning prerequisites. Figure X illustrates the change in the division of points number in the "Task Completion" area, where the highest value of the contingency coefficient was calculated (Figure 7).

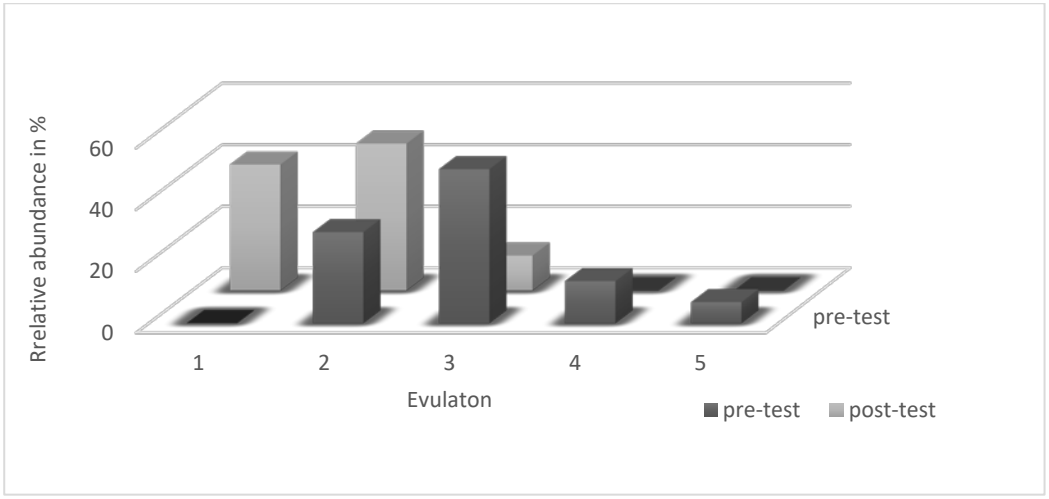

Fig. 6. Division of the children number according to results in the field of "Emotions, school motivation" (in %)

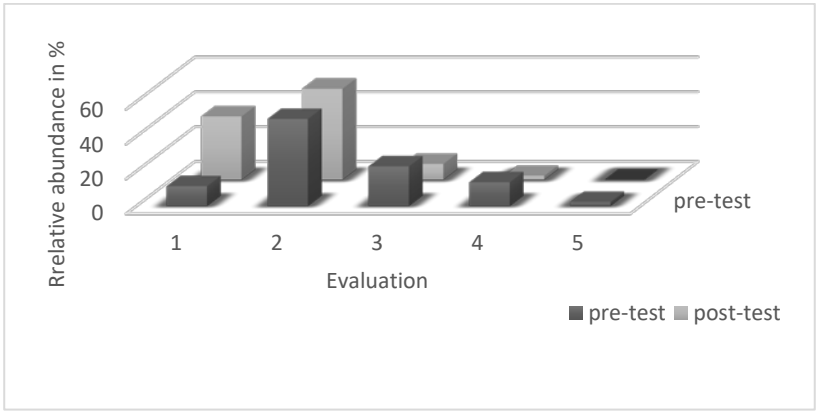

Fig. 7. Division of children number according to the results in the area "Completion of the task" (in %)

D) Interview analysis

The data from the interviews gave us feedback on the different level of effectiveness of individual activities from the perspective of teachers and parents.

According to the teachers, one of the positive aspects of the activities was the formation of children's ideas about future learning activities at school. The activities were mostly easy to work with because the children knew the pictures of school supplies. The tasks were adequate to the children's capabilities, understandable and interesting. The findings confirmed the selected statements of the teachers: "In the activities, there was room to express ideas about life at school and also to develop the creativity of children, who were able to propose alternative uses of selected subjects at school." In the teachers' answers, there were often opinions about activities aimed at strengthening school motivation. Children expressed their own expectations and emotions associated with acquiring new knowledge and skills. The teachers mentioned some of the children's reactions: "I will learn to read and write, then I will be able to read a fairy tale myself" and "I will be smart, I want good grades in the student book."

The intention of the interview analysis was also to reveal the reasons for the lower efficiency of the selected activities.

According to the teachers, some of the activities required mental operations that the children could not handle. Some activities consisted of several tasks. It was challenging for the kids to stay focused and complete them. During the implementation of the activities, the teachers had to repeat the instructions several times and guide the children's activities. The teachers' opinions are illustrated by the statement: *"In my opinion, this activity was difficult in terms of the children's age characteristics. It was difficult for the children, because they had to analyze and compare,*

which they still cannot handle at this age. I would rather divide the activity so that the students can complete it."

It was clear from the interview that the teachers appreciated the initial training to carry out the activities and ongoing methodical support. The teachers said that thanks to the instruction on the activities, they knew how to work with them. At the same time, they expressed they are often looking for some activities, but sometimes their description is unclear. It was summed up more precisely by the teacher, who said that "*during the training, I received all the information about the activities - what I should do with the children, what the activities are aimed at, what to watch out for, what to notice. Methodical support and security were important to me."*

Parents' opinions mainly included positive feedback on activities for children. They managed their implementation in the home environment without difficulty. On the part of the parents, it was necessary to familiarize themselves with the tasks in advance and create the conditions. Comments of one of the parents: *"It was very interesting to observe how my child coped with the tasks."*

3. Discussion

The analysis confirmed that the range of changes in terms of point difference between individual measurements was more pronounced in the experimental group (decrease of 24 points) than in the control group (by 5.5 points). This means that in the experimental group, as a result of our set of activities, the selected abilities of the respondents were strengthened (e.g. children's ability to understand the teacher's instructions, plan activities in accordance with the given instruction, create an idea of the result, the ability to self-regulate, etc.), which helped to form assumptions to future learning skills. The respondents of the experimental group had a four times higher drop in points than the respondents of the control group in the output measurement. A lower number of points predicts a higher readiness of children in the field of learning prerequisites, which belong to one of the indicators of the pupil's school readiness and the formation of his/her subjective position in future learning activities. Its importance is confirmed by several authors (Boethel, 2004; Yuksel et al. 2013; Birken, 2019), who point to the connection between the level of school motivation, willpower and coping with difficulties and obstacles in school situations. Based on our research, we conclude that the implementation of activities aimed at individual areas of children's learning prerequisites reduces the risk of adaptation problems of first-year elementary school students to the school environment. It is the insufficient level of readiness of beginning schoolchildren for school that is the most common cause of children's adaptation problems (Margetts, 2002; Hurrelman, Bründel, 2003; Niesel, Griebel, 2005; Ahtolaa et al. 2011; Dockett, Perry et al. 2011; Borbélyová et al, 2018 and others). Our research indicates that one of the possibilities for solving this problem is the creation of suitable activities aimed at increasing the level of the child's readiness for school.

The formation of the child's prerequisites for the implementation of learning activities at school is one of the important determinants of the gradual identification with the role of a pupil. According to Zhao (2017), raising the cognitive level is an essential part of pre-primary education. The activities were designed in such a way that the children's attention gradually shifts from the game to the schoolwork led by the teacher. According to the teachers' statements in the interview, the children accepted this gradual change and actively participated in the activities. This confirmed the recommendations (Wildres, Wood, 2023) that children in preschool age not only play, but also engage in adult-directed activities. Therefore, to increase the effect of the activities, we also involved parents in their application. In the activities, children's skills, necessary for school education, were gradually developed.

At the same time, the values of the contingency coefficient for individual learning prerequisites in table 1 show different degrees of connection between the activity and its influence on the development of the given area of learning prerequisites. We calculated a moderate degree of coupling in the areas of "metacognitive skills" and "task completion". We can interpret this finding as identifying the need to modify the "Cube" and "Road to School" activities, supplement them or implement them multiple times. The teacher expressed a specific suggestion: "Children's volitional effort is gradually formed, so the activity would require multiple repetitions." The stated findings indicate the need to formulate clear instructions for teachers to carry out selected activities. Several expressions of the teachers related to the difficulty of understanding the tasks: "Sometimes I wasn't sure what the children were supposed to do in the activity." Thanks to the feedback from the teachers, which was obtained through interviews, it is possible to gain a deeper understanding of

the information that results from the statistical analysis of the quantitative data. It is the close cooperation of researchers with teachers in practice that can contribute to the creation of really high-quality and well-targeted activities that will help develop the necessary competencies in children and pupils (Sepehrinia, Mehdizadeh, 2018).

The results of the statistical analysis show a significant degree of connection between activities and the development of children's ability to plan their activities. Among the respondents of the experimental group, there was a significant shift in school motivation, which we consider a positive effect of the inclusion of activities as a whole. It turns out that the partial replacement of games with teacher-led activities creates an interest in school in children, which internally motivates them to learn about an unfamiliar environment. The established connection is also confirmed by the statements of female teachers in the 1st year of elementary school. According to their statements, they observed an increased interest in school among the pupils, which was manifested by the fact that the pupils enthusiastically talked about the new skills they acquired at school. Another of the benefits of the activities as a whole, which emerged from the interviews with the teachers, was the children's increased ability to establish social relationships and the desire to be a good pupil. In the experimental group, there were only a few children with a negative perception of school, which preschoolers pick up from their surroundings, especially older siblings (Dockett et al. 2017; Henderson & Mapp, 2002). The above results show that the children's own experience with the school, which is mediated by suitable activities in the kindergarten, can reduce their negative attitude before entering the school grounds.

We consider the set of activities to be inspiring for pre-primary and primary education teachers' own work. We see the benefit in the possibility of processing them, focusing on the formation of children's learning assumptions, and subsequently in the process of verifying effectiveness through mathematical and statistical methods. Similarly, professional literature (Hansen et al., 2012) emphasizes the need for intervention in the preparation of the child to enter formal education. Teachers can include intentional activities to strengthen readiness, improve emotional and cognitive aspects. However, current research (Nicholas et al., 2021) points to the development and preparation of a child for school in accordance with his potential. The implemented activities should be based on a combination of standardized requirements and an individual approach, which would enable the teacher to support future schoolchildren in developing the necessary skills.

Psychological research (Fredrickson, 2001; Matthews, 2008) proves that forming a positive image of near future, of school, of future learning activities, of rules, of relationships will help children to create a positive image of the future, reduce tension, fear of new. This concept also implies the main task of preparing children at the end of pre-primary education in kindergarten and in the family.

Based on the summarized results of the experiment, we would like to note that we consider the benefits of the application of a set of activities, among others:

– Systematic and purposeful stimulation of the level of learning prerequisites of children at the end of pre-primary education and at the beginning of primary education;

– Early focus on future and beginning schoolchildren in order to prevent, or eliminate the occurrence of adaptation difficulties at the beginning of schooling;

– Teamwork of all involved (teachers, parents, educators);

– Its flexibility – it is available to teachers and teachers can adapt it or be inspired when creating their own programs.

The findings of this study highlight the positive potential of targeted stimulation of learning prerequisites in the preschool period and, at the same time, open up avenues for further research focused on the long-term effects of such interventions on children's academic success after entering primary education. Future studies would benefit from longitudinal research aimed at tracking the persistence of observed effects over time, particularly in relation to the development of reading and mathematical literacy, school adaptation, and self-regulatory abilities.

We also recommend paying attention to the variability in the effectiveness of interventions with respect to individual characteristics of children, such as cognitive maturity, language competence, learning motivation, and social skills. Equally important is the consideration of contextual factors within the school environment, including the quality of teacher-child interactions, family support, organizational and material conditions in the classroom, and the nature of teaching methods and pedagogical approaches.

A more comprehensive understanding of these interrelations can contribute to the more effective design of educational interventions and support an inclusive approach to developing learning prerequisites in children from diverse backgrounds.

4. Conclusion

In conclusion, we can state that the application of a set of activities has managed to significantly increase the level of pupils' learning prerequisites. At the same time, it is important to note that the application of the transition program monitored the potential passing of the occurrence of pupils' adaptation difficulties. A set of activities designed by us and experimentally verified can significantly help a child's smooth transition to elementary school and successful adaptation. The set of activities became a research-confirmed concretization of the support of learning prerequisites, while parents and teachers of pre-primary and primary education actively participated in its implementation. We are aware that currently the emphasis is on strengthening the inclusive approach already in the initial education of pupils. The intention is to level the skill level of beginning schoolchildren to ensure a successful start to school education. The entry of children into the first year of primary school is a challenging period that requires the solution of a full range of questions on both a theoretical and practical level. In the given period, the pupil's school path is intensively created, which presupposes purposeful stimulation of his personal readiness and the application of support strategies from the family, kindergarten and primary school.

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