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#### ORIGINAL PAPER

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## THE TEACHER – ORIGINATOR OF STUDENT ACTIVITY DURING PLAY AND DEVELOPMENTAL TASKS

### NAUCZYCIEL – KREATOR UCZNIOWSKIEJ AKTYWNOŚCI PODCZAS ZABAW I REALIZACJI ZADAŃ ROZWOJOWYCH

**Keywords:**  
teacher, play,  
development task

**Summary:** The article focuses on the teacher's role as the organizer of play and task activities in grades 1–3. The authors have assumed that play is a relevant and natural part of children's lives that results from their inner needs and has great meaning for the development of all aspects of children's personalities. Play focuses within itself all developmental tendencies of children. It is a source of development for children and establishes the zone of proximal development. On the other hand, the development and didactic tasks designed by the teacher are important in the activity of a school. In elementary education, the role of the teacher is to choose adequate tasks for the individual needs and possibilities of students. The tasks presented

to the students should be difficult enough to activate their whole developmental potential and motivate them to be active.

The scope of topics presented in this article required the participation in educational situations organized within the educational project realized in the Institute of Pedagogy of the Maria Curie Skłodowska University “Beyond the Threshold.” Explorers’ Expeditions.

The method incorporated was the teaching experiment, that is, an original educational project that looks into the capabilities of pupils in classes 1–3 in selected areas. The project was carried out from November 2018 to June 2019. Organization of the teaching experiment required the creation of circumstances in which the pupils observed undertook task and play activities. The situations were observed and analyzed. The observation enabled the authors to define, among others, the role of the teacher in the process of creation of the development circumstances, to observe the forms of activity of the pupils in play and tasks and the relations among them. The model of research incorporated active observation. The pupils’ individual activity and group work were under observation. Moreover, the research included analysis of the pupils’ creations.

The researchers looked for the answers to the following questions:

- What tasks should be performed by the teacher who is leading the children’s activities during play and developmental tasks?
- What peer relations can be observed during arranged play and tasks?
- How do the pupils deal with the tasks aimed at designing?
- What is the difference in constructions made by children individually and during group work?

The results of the research enabled the authors to define the role of the teacher who designs the activity during play and tasks as well as to formulate methodological conclusions that are useful for the elementary education teachers.

**Słowa kluczowe:**  
nauczyciel, zabawa,  
zadanie rozwojowe

**Streszczenie:** W prezentowanym artykule autorki skupiły się na zadaniach nauczyciela jako organizatora aktywności zabawowej i zadaniowej uczniów klas I–III. Przyjęły założenie, że zabawa jest bardzo istotnym, naturalnym elementem życia dziecka wynikającym z jego wewnętrznych potrzeb, ma ogromne znaczenie dla rozwoju wszystkich sfer osobowości dziecka. Zabawa skupia

w sobie wszystkie tendencje rozwojowe dziecka. Jest ona dla dziecka źródłem rozwoju i stanowi najbliższą mu sferę rozwoju. W pracy szkoły ważne są zadania rozwojowo-dydaktyczne projektowane przez nauczyciela. W edukacji elementarnej rolą nauczyciela jest dobór odpowiednich zadań do indywidualnych potrzeb i możliwości uczniów. Zadania stawiane wychowankom powinny być na tyle trudne, aby uaktywniły cały ich potencjał rozwojowy i zmotywowały do aktywności.

Tematyka badań zaprezentowana w artykule wymagała uczestniczenia w sytuacjach edukacyjnych zorganizowanych w projekcie edukacyjnym realizowanym w Instytucie Pedagogiki UMCS: „*ZA PROGIEM*” – *wyprawy odkrywców*.

Metodę stanowił eksperyment nauczający, czyli autorski projekt edukacyjny badający możliwości uczniów klas I–III w wybranych obszarach.

Projekt był realizowany od listopada 2018 do czerwca 2019 roku. Organizacja eksperymentu wymagała stworzenia przestrzeni edukacyjnej, w której uczniowie podejmowali aktywność zabawową i realizowali zadania rozwojowe. Sytuacje edukacyjne były obserwowane i analizowane. Obserwacja pozwoliła określić rolę nauczyciela w tworzeniu warunków rozwojowych, zaobserwować formy aktywności uczniów oraz relacje między nimi. W badaniach wykorzystano obserwację uczestniczącą. Badaniom poddano aktywność uczniów, którzy podczas wykonywania zadań pracowali indywidualnie i zespołowo. Dodatkowo w badaniach wykorzystano analizę wytworów uczniowskich w zadaniu „Projektant” i zadaniu o charakterze konstrukcyjnym.

Z perspektywy badacza szukano odpowiedzi na cztery pytania:

- Jakie zadania stoją przed nauczycielem kreującym dziecięcą aktywność podczas zabawy i zadań rozwojowych?
- Jakie relacje rówieśnicze zachodzą podczas zaaranżowanych zabaw i zadań?
- W jaki sposób dzieci radzą sobie z zadaniem, które polega na projektowaniu?
- Jaka jest różnica w konstrukcjach stworzonych przez uczniów indywidualnie i podczas działań zespołowych?

Wyniki badań pozwoliły na określenie zadań nauczyciela projektującego aktywność zabawową i zadaniową uczniów i sformułowanie wniosków metodycznych przydatnych w pracy nauczycieli edukacji elementarnej.



## Tasks of the Teacher as the Originator of Children's Play

Johan Huizinga (2007, p. 29) argues that

[...] we might call [play] a free activity standing quite consciously outside “ordinary” life as being “not serious,” but at the same time absorbing the player intensely and utterly. It is an activity connected with no material interest, and no profit can be gained from it. It proceeds within its own proper boundaries of time and space according to fixed rules and in orderly manner. It promotes the formation of social groupings which tend to surround themselves with secrecy and to stress their difference from the common world by disguise or other means.

The theoretical basis of the following article is a concept developed by Tina Bruce, who claims that play is a creative act, “its participants implement individual ideas, reveal emotions, and build new qualities and relationships. At the same time, they are immersed in activity in a dynamic way” (Bilewicz-Kuźnia, 2017b, p. 114). In Bruce’s opinion, play is an activity that *flows* freely between time, space and reality. According to *flow theory* (Csikszentmihalyi, 2005), optimal experiences are associated with a high level of concentration, full commitment and a deep sense of satisfaction and joy. In Sabina Guz’s terms (2016, p. 267), play, “as a manifestation of one’s own activity, is subordinated to self-regulatory mechanisms, and its character depends on the level of the general development of an individual;” it also involves all developmental tendencies of a child. As such, it is a source and the proximal zone of development for the child (Filipiak, 2011). According to research by Guz (2016), Grzeszkiewicz (2015) and Bilewicz-Kuźnia (2017a), the value of playing in terms of developing the child’s potential in all areas is significant. While playing, the child

- is involved: plans the course of the activity and manages it, changes strategies, adds ideas, exercises their imagination, tests their own abilities and limitations;
- independently notices and solves problems, learns to improve their actions, learns perseverance;
- “tests their strength and possibilities, personally makes choices regarding, for example, the use of specific accessories and symbols necessary to stage and dramatize the action” (Guz, 2016, p. 266);
- feels pleasure, but also obeys the rules of the play and exercises strong will;

- develops social contacts, learns how to cooperate, divide tasks and jointly establish an idea, develops a sense of duty and the ability to evaluate activities and their effects;
- develops entrepreneurship and “bears responsibility for the selection of roles, props and partners” (Grzeszkiewicz, 2015, p. 197);
- “Independently, on their own will and their own initiative, discovers for their own use new associations and connections between elements and relations” (Bilewicz-Kuźnia, 2017a, p. 232).

As asserted by Guz (2016, p. 265),

[...] it is much easier for a teacher to manage a child's behavior and control all their activities when the child participates in activities planned and organized by the teacher, often for the whole group, the course and results of which can be predicted, than to have an educational impact on children who independently undertake activities and play in various places alone or in small groups.

According to the theory of social and cognitive constructivism, which is another theoretical point of reference of this article, the tasks of the teacher – the originator of children's play – are complex. In the first place, the teacher's work consists in organizing external conditions for the play to happen, that is, setting out a place in the classroom and in the playground, organizing inspiring game corners (thematic, research, theatrical, heuristic), and equipping the classroom, gardens and school playgrounds with the necessary, attractive aids and toys. It is equally important for the teacher to create internal conditions for the play, in other words, providing children with news about the world, enriching their experiences related to social relations and facilitating their understanding of relationships and connections. Guz (2016, p. 273) believes that “it is important for the teacher to ensure that the play takes place in the right atmosphere for the children to know that they are cared for, to have a sense of security, to be convinced that they can play without any obstacles, and that they do not have to be afraid of anything or hide their toys from their peers.” In positive social relations, the teacher establishes the rules and agreements that apply in the play together with the children. The teacher, according to Guz (2016, p. 274), can sometimes stimulate the initiative and creativity of children in play and “help them overcome difficulties.” He or she should discreetly watch over the course of the play and carefully observe the pupils participating in it in order to make it more attractive, if necessary, to maintain its course, and to

show further perspectives of the play and suggest new possibilities. The teacher should constantly remember that in the course of play, they are the children's partners, watchful assistants, and not the managers of their activities. Using the approach of social constructivism, Bilewicz-Kuźnia (2015) emphasizes the role of other people, both children and adults, who stimulate play. The author draws attention to the use of "the resources of the environment and the potential of the group, in which there will be more competent peers who can do more than the teacher" (2015, p. 20).

### **Designing Developmental Tasks by the Teacher**

In elementary education based on the concepts of Bruner and Vygotsky, it is the role of the teacher to thoughtfully introduce the child to the world in appropriate cultural and communication contexts. The tasks assigned to children should help them build an internal model of the world (Bruner, 2006). Therefore, they should be difficult enough to activate the students' full potential but, according to Vygotsky, they must also be in their zone of proximal development (Filipiak, 2011). In the culture of learning, the teacher's task is to get to know the students, diagnose their skills in particular areas, and only then to organize the learning environment (Filipiak, 2011). In the classroom, students can perform developmental tasks both individually and as a team. During individual work, they rely on their personal potential of knowledge and skills; during teamwork, inspired by a problem (of a scientific, social or practical nature) hidden in the task, each participant contributes their own ideas, their own strategies of conduct, their own knowledge about the world and their acquired skills. According to Jolanta Andrzejewska (2019, p. 88),

Educational tasks should enable students to do the following: analyze (mentally separate the given totality of objects, phenomena and situations, and discover their components), synthesize (mentally merge the elements separated in the analysis), compare (objects, phenomena or situations, and then recognize the differences and similarities between them), generalize (present properties common to some class of things or phenomena), and abstract (highlight one property of a thing, phenomenon or situation, while omitting other features).

The tasks should arouse curiosity and cognitive conflict, and offer a secret to discover, which will inspire and motivate students to act. The stimulus in

developmental tasks can be interesting objects, teaching aids encouraging creative activity, known objects used in a different way than usual and situations rarely occurring to children. The interpretation of stimuli depends on the knowledge and previous experiences of the students, the social context in which they find themselves and their understanding of the cultural context. “Tasks designed by the teacher in early childhood education should consist in discovering, learning or recognizing information and situations” (Andrzejewska, 2019, p. 89). Therefore, a developmental task should encourage teachers to search for information in various sources of knowledge (textbooks, guides, the Internet, authorities and experts). According to Joanna M. Garbula (2016, p. 50), educational situations should “enable the creation of unlimited meanings;” developmental tasks are to inspire creative activities and the search for non-obvious solutions. According to research (Guz, 2010; Grzeszkiewicz, 2006), the developmental possibilities of preschool children are the greatest, which makes it the easiest and most effective way to eliminate developmental deficits through appropriate work and tasks.

By creating the right conditions for performing tasks in the classroom, the teacher decides about the quality of interaction between students (Andrzejewska, 2013, p. 387). During the task, it is important for the students to be able to communicate, show individual ways of understanding the world, make decisions together, correct their approach to a problem and have the time and opportunity to look for better solutions. The more opportunities the students have to decide on the method of solving the task, the adopted strategy, the workplace, the well-being of their peers and their roles in the task, the more they will identify with their work (Andrzejewska, 2013, p. 317; Bałachowicz, 2017, p. 76). According to Daniela Braun (2002, p. 10), “the more a given learning situation gives them a sense of security, the more they feel supported, the more they try things out, attempt to find out how these things work, and examine their environment to draw conclusions from these investigations.” The teacher should build a space to carry out these tasks. Research by Andrzejewska (2013; 2018) and Guz (2015) shows that such a space should be flexible, dynamic, multi-dimensional, taking into account social, cultural and natural contexts. It follows from the concept of social constructivism that appropriate interactions between students when working on a problem become developmental factors.

## Empirical Context

The subject matter of this research required the participation in educational situations organized under the project entitled “BEYOND THE THRESHOLD – Explorers’ Expeditions,” carried out at the UMCS Institute of Pedagogy. The chosen research method was a pedagogical experiment (Filipiak & Lemańska-Lewandowska, 2015, p. 47), based on the assumptions of cognitive and social constructivism and Bruce’s concept of play. It was an original educational project examining selected skills of students in grades 1–3, carried out between November 2018 and June 2019. Its participants were students from grades 1–3 divided into 8 groups, each consisting of 12 people. The experiment required the creation of an educational space in which the students took up play activities and carried out developmental tasks. Educational situations were observed and analyzed. The observation allowed the researchers to determine the role of the teacher in creating developmental conditions and to observe the forms of students’ activities, and the relationships between them. Participant observation was used in the study. The activity of students who worked both individually and as a team was tested. Additionally, the research used the analysis of the students’ projects in a task called “Designer” and in a construction task.

Answers were sought to four research questions:

- What challenges does the teacher face in creating children’s activity during play and developmental tasks?
- What peer relations occur during play and developmental tasks?
- How do children cope with the design task?
- What is the difference between projects created by individual students and teams?

## Educational context

For the students participating in the project, it was important to acquire experience in various educational situations, as well as in research, theater, construction and didactic play and tasks. In “BEYOND THE THRESHOLD – Explorers’ Expeditions,” educational situations were planned on the basis of:

- The transformative and participatory model of education (Bałachowicz, 2017, p. 46);

- Individual and collaborative learning in teams (Dumont, Istance & Benavides, 2013);
- The value of play in the development of a child (Guz, 2016).

The first developmental-didactic task of a design and creative nature was divided into two stages. Wooden cubes with dimensions of 20 × 20 × 20 mm, Gracjan's blocks and counters, and decorative pouches were used. In the first stage, the children received counted blocks (15 pieces) in colorful translucent bags and were asked to arrange a structure individually. In order to encourage the students, the teacher suggested assembling the pieces into the shape of a cat. After presenting the idea to all the children, it was suggested that they should create a structure according to their own plan. Children could use all the blocks (15 pieces) or some of them as well as the bags in which they were packed.

At the second stage of the developmental task, students organized themselves into teams of six people. Their task was to combine their resources of blocks and work together to create one spatial structure entitled "Toweranimal." The aim of the didactic task was for the children to give up their possessions for the duration of the task and connect their own blocks with others to develop abstract thinking, jointly put forward ideas, negotiate and to, finally, create the structure together.

Developmental task number 2 called "Designer" was aimed at developing the students' sense of agency and creativity as well as their ability to solve problems related to design. This educational situation focused on designing a packaging for crayons to the students' own liking. The children could use crayon boxes (made of gray cardboard, without decorations), to decorate them with inscriptions and pictures using pencils, felt-tip pens, blue and red writing pens and soft pencils. The task began with a conversation about a designer's work and its results. After that, the students were given crayon boxes and other supplies, and assigned the task of decorating their own crayon box according to a personal plan. Thanks to this activity, their involvement in specific spatial and material conditions and interaction with their peers in an atmosphere of joy, the students immersed themselves in creative play based on their imagination and experiences.

Educational situation number 3 was related to playing with a peer. In the "BEYOND THE THRESHOLD – Explorers' Expeditions" project, students could use an educational space called "Room full of inspirations" in which there were teaching aids encouraging children to play research, didactic and construction games as well as to use theater and music.

The equipment of the “Room full of inspirations” included, among others:

- A set of 25 “strange” musical instruments made of various materials,
- 100 tablets with different surfaces to test their texture; the children could examine the tablets with their hands or feet,
- A set containing various types of tweezers and tongs as well as items they could grasp such as beads of various sizes, walnuts, spindles, yarn and foam pompoms, jelly beans and small balls;
- A set of 30 types of soap with different consistencies and scents,
- Jigsaw puzzles made of ice-cream sticks with fragments of pictures stuck on them to form an image,
- A set of puppets – hand puppets and boxes depicting a castle, palace, tenement house and a house,
- A set of wooden blocks – blocks of different heights and colors, wooden spindles and 40-cm-long wooden sticks.

Each day of the project, for the duration of one lesson, always after lunch, the children could use all the toys, aids and utensils in any way, inventing their own games.

### **Results of Observation and Analysis of Students' Projects**

**Play activity.** The organized space of the “Room full of inspirations” was used to estimate to what extent the designed material as well as organizational and personal conditions would encourage students to independently undertake various spontaneous play activities with their peers.

The conducted observations allow us to conclude that the preparation of an educational/play room richly equipped with original items, providing an atmosphere of acceptance, tranquility, joy and wonder, as well as planning a fixed time and a ritual of play (fun after lunchtime) made the students willing to undertake play activities in pairs or in teams of three.

During the activities, the children took the time to think about the structure of the play, often modified its rules or changed their activity, switching to other aids and props.

The children most willingly took up and initiated games with “strange instruments.” First, through manipulation, they examined what they were made of and tried to make sounds in various ways. Then, they shared their discoveries with their peers and showed the ways of playing they developed. In this way, they created a new reality of play. Three children from class III – out

of 96 participating in the project – came up with the idea of starting a band, chose instruments and a musical piece (“Are You Sleeping/Brother John”), and started making music. They were happy and proud of their idea.

All children undertook play activities with tweezers and tongs. Initially, the students had fun putting different materials into several containers. Then they modified the activity and created a composition from different materials with the use of tools (tweezers). Some children of different age groups created, among others, mandalas, pictures, rhythms, “cakes,” “sandwiches” and “sushi,” while the rest had the opportunity to observe and imitate the behavior of their colleagues.

The sensory tablets were also very popular with the students. The initiator of the activity was always one child who spontaneously approached the box and explored its resources with interest. Then they called in another child. The children, playing spontaneously at first, closed their eyes and examined all the tablets with their hands. Then they looked for companions, matched up in pairs, and invented tasks for each other according to their own ideas, for example, finding a specific tablet, sorting the tablets by one feature (softness, roughness, prickliness) or finding a matching pair. Some students, emboldened by the play, took off their shoes and studied the texture of the tablets with their feet. Then they invented movement games, for example, jumping over selected tablets on both feet or making “a maze between prickly tablets.”

Children liked to study the texture and method of making hand puppets from socks and various materials. Most often, they were delighted with the possibility of bringing various characters to life after putting a sock puppet on their hands. They frightened each other, made each other laugh and parodied each other. One educational situation which we consider particularly noteworthy was when three pairs of girls first studied the puppets and hand puppets made of socks and wooden spoons and, then, in the course of cooperative learning, agreed to put on a show. After selecting the most interesting props and assigning roles, they spontaneously started playing theater games using a bench, a window sill, a castle, and a palace made of cardboard boxes as a stage.

Two groups of three children started a construction game with the use of blocks, aiming to build the highest tower possible. The game required concentration, precision of movement, cooperation in arranging subsequent blocks, creativity and co-deciding on the choice of strategy once the tower deviated from the vertical position. Fun turned into a game and a competition which was encouraged by other students. Its goal was to build the tallest

tower. The team whose tower had not collapsed before its height was measured with a carpenter's rule was the winner. The game aroused various emotions – from the joy of winning to an outburst of anger and disappointment that the tower was not measured. Children enjoyed each other's presence, confronted their own ideas with the point of view of others, and tested their strength in competition with others.

Individual children also became interested in the puzzles made of ice-cream sticks. They devoted the least attention to examining the features of the collection of 30 different soaps. Some children moved smoothly from one play to the next, inspired by the activity of their peers, their discoveries or their friends' suggestion that it is worth playing with a given item. In each group (regardless of the age of the children), there was one child who preferred to sit, watch other people play, rest or eat a snack during this time. Their choices were respected because play is an unforced and voluntary activity (Bilewicz-Kuźnia, 2015; Bruce, 2012; Przetacznik-Gierowska, 1993). The child must always be aware that they can refuse to play and do something else they enjoy instead. On the part of the teacher, it is important to respect the child as a person deciding about the nature of the activity they wish to pursue.

The observed activities required quite a long time (about 45 minutes) for the free, spontaneous play of the children. The time was used for:

- The choice of a teaching aid by the children,
- Entering a group,
- Recognizing the norms important in the group,
- Inventing play,
- Co-creating it with other group members,
- Making improvements and modernizations, e.g., rules.

In the context of the analyses and observations discussed, the richness of the material and the social environment have a significant impact on the play activity of students in grades 1–3. The teacher – the game originator – should plan time for students to take up fun activities and games at school (a long break at a fixed time), find quite a large space (the classroom, mezzanine, corridor) and prepare various sets of teaching aids, toys and props so that students can make their choices and act according to their own interests. It is important to include unexpected materials that will surprise and motivate the children to act. The teacher should be ready for the emotions that children will experience in play, ranging from joy, curiosity and contentment to regret, anger, shame, jealousy, depression and sadness. According to Bożena Grzeszkiewicz

(2015, p. 203), these emotions inform the teacher which children “have developed constructive ways of managing their own emotions (e.g., they control themselves, control crying)” because they will “generally have more success in contacts with their peers.” The teacher can notice who in their class experiences positive or negative emotions more often. When arranging the school reality, teachers should not only focus on tasks and exercises, but also use the natural desire of children to interact and play with their peers. The early experiences of the child in playing with their friends will help them to build lasting and diverse social relationships in the future.

### **Students' Activity in a Task Carried Out Individually and as a Team**

Developmental task number 1 was designed to observe how the students perceive the problem and solve the task individually and in cooperation with their peers. The object of the study was the activity of a child with various objects which resulted in a specific design/structure (Kubicka, 2003). The situation allowed us to observe the social behavior of the children, their confidence in their own abilities and how they solve the problem.

Relationships between students in this activity were of two types. During the individual task, the children focused on the project; they coped with the task in various ways. Most children, not having their own ideas or not trusting that these would be interesting, watched their peers and imitated their work. Whenever a classmate did something original, the others were delighted and asked them how they came up with the idea. It is worth emphasizing that there was not a single student who did not make at least three structures, and the record holders created six objects each. Most of the children worked very quickly, building flat structures depicting the figure from the side. They made the structures of a dog (Photo 1), an elephant, a girl, a rabbit and a snake, or built one high tower, two towers supporting each other or a tower with supports. Often, students did not anticipate the consequences of their actions and created structures that fell apart quickly. Similar results of children's activities in a creative task were observed by Dorota Kubicka (2003).

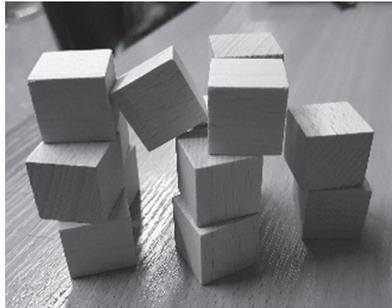
The children who created original works acted independently. At first, they tried the blocks out for a while, arranged them in groups, piled them up and introduced changes to their designs in order to build a spatial or flat structure from a different perspective, for instance, from above or *en face*. Sometimes they introduced additional material such as the bag in which the blocks were

kept, a pen or a string. The most original works, in terms of their subject matter (Photos 2–5), presented a robot, a pyramid, a castle, a scorpion, a hippopotamus and a crocodile. One child went beyond the scheme and made a figure in motion – a “Running Elephant.” All in all, however, it may be surprising that the children had relatively few ideas for building strategies from the 15 bricks available.

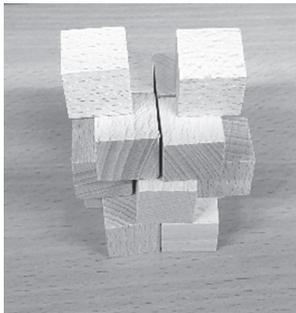
Table 1  
*Examples of individual works by children. Stage I.*



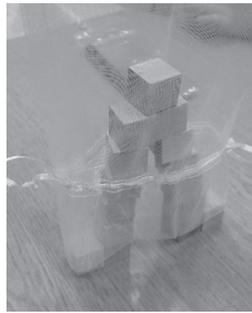
*Photo 1.*  
 Dog.



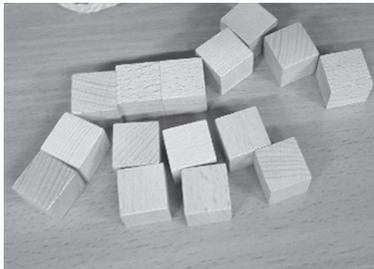
*Photo 2.*  
 Elephant.



*Photo 3.*  
 Dog's head.



*Photo 4.*  
 Robot.



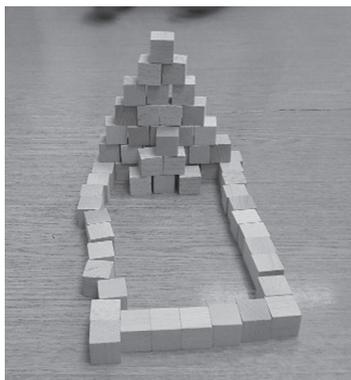
*Photo 5.*  
 Running elephant.

At the second stage, the children worked in groups of six and combined the blocks (90 pieces) to build a common structure. The task required the students to be able to act cooperatively. The educational setting provided good conditions for observing the social and cognitive behavior of children, their manual skills, spatial imagination, and flexibility in thinking.

It is worth noting that four student teams from grade III had difficulties with communication and did not create a common structure. During the task, children in these teams often took blocks away from each other, arguing about which idea should be implemented; they took offense, blamed each other for no effect; they demanded submission and admonished others. There was no single leader in the teams and no roles were assigned. However, even the lack of results was developmental, as the students, summing up their work, came to the conclusion that “you should communicate,” “there must be no outsiders in the group,” and “everyone must play roles in the team” (i.e., the roles of a leader, idea giver, constructor and reconstructor, who introduces changes and replaces old solutions with new improvements). In the teams where students failed to complete the task, two children usually dropped out, which was not observed in the teams that achieved the goal.

Common structures were created in 12 student teams. In order to achieve the goal, the students talked a lot with each other, conducted a kind of “brainstorming” session, agreed, negotiated, jointly devised a concept, and were deeply involved in the task. The motivation of children in these teams increased with the difficulty of the task at the time of the problem: for example, when the structure was falling apart, the children did not give up, but came up with new solutions, and modified or changed the concept together. In each team, the following roles emerged: a leader, originator, helper-builder, modifier and the person naming the work. At the end of the activities, the students put a label with a name on their structure. As a result, eight spatial works with a complex constructions were created, entitled: “Man,” “Tower with a Dog,” “Castle,” “Rabbit Tower,” “Sphinx’s Pyramid,” “Tower,” “Towerelephant,” and “Towermouse.” Four flat structures with ornaments were called “Tree,” “Dog,” “Horse,” and “Leopard.” Finishing the work was associated with feelings of success of the entire team and creating close relationships with peers.

Table 2

*Examples of children's teamwork. Stage II.**Photo 6.*  
Sphinx's Pyramid.*Photo 7.*  
Towermouse.*Photo 8.*  
Rabbit Tower.

The analysis of the students' activity confirms the observations of developmental psychologists that the child is an autonomous, active, creative and complete individual. Children in favorable play-task situations show stimulated creativity, as evidenced by previous studies by Janina Uszyńska-Jarmoc (2003; 2007), Dorota Kubicka (2003) and Wiesława Limont (1997). Analysis of the structures made by the students shows that the children did not always take the topic of the work into account. Multiple collapses of the structures prove that they did not take the laws of physics into account when constructing them. The constructions are not the result of a common plan, but the result of experimental exploratory activities and a certain compromise. The developmental task in Stage II promoted the collaborative learning model by solving a complex problem together. With a properly organized task, students

showed that they had the potential to effectively solve problems together and be successful. Working in teams encouraged them to refine their knowledge through argumentation of positions, exchange of experiences in the field of physics and recognizing contradictions. Differences related to knowledge, experiences and possibilities of joint action depending on the class group were observed. Two class teams whose teachers declared that they used teamwork on a daily basis during lessons, performed much better than the others. Working together contributed to their understanding of the need to divide roles and provide help. According to research, the vast majority of children have the opportunity to learn cooperatively with their peers.

### **Students' Activity During the Implementation of the Design-Based Task**

In the developmental task entitled “The Designer,” the solution to the problem was related to the initial resource analysis, independence and flexibility in thinking, the use of declarative knowledge about designers' work in the context of the activity and trust in one's own competences.

At the outset, it should be noted that the task was a great novelty for the students, who started to design the crayon box with great eagerness and enthusiasm. The children were curious and motivated, which was expressed in smiles, gestures and concentration of attention as well as creative silence. Before starting work, the children talked about designers they knew, usually of fashion or cars. Their initial reaction to being presented with the boxes of crayons without any decorations or inscriptions and learning the purpose of the task was surprise. The implementation of the task required time and a great deal of independence. Most students, regardless of their age, thought for a long time before getting down to work. The designs differed in terms of their subject matter, technique of execution and the way of decorating. The themes for embellishing the walls of the boxes were drawn from the real world, movies, computer games and the children's own experiences. There was not a single abstract work (results consistent with the research by Szućik, 2019). Lack of experience or lack of faith in their own abilities meant that most children looked for ready-made solutions and performed the task by imitating the work of their peers. On the boxes, therefore, one could find:

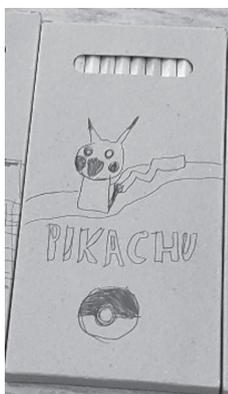
- Inscriptions: the children's names and surnames, the inscription “crayons,” bar codes, names of cartoon heroes (Pokemons) and computer games (“Angry Birds”);

- Drawings: unicorns, ponies in various colors, a rainbow, a sun, a flower, a tree, a football, the Polish flag, and sweets (ice cream cones, lollipops and candies);
- Portraits and self-portraits: the child with a parent or siblings, Robert Lewandowski (a footballer), cartoon characters;
- Scenes: a soccer field with children playing, a house and flying birds, a meadow full of flowers and butterflies, racing cars like Ferrari, and trucks moving along the road.

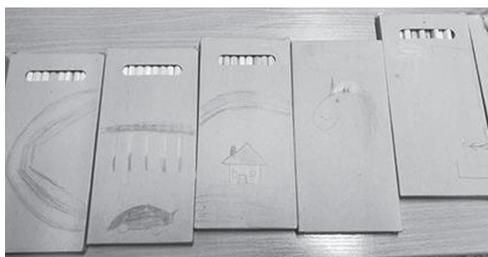
Based on the obtained analyses, it can be concluded that the children had difficulties considering the entire problem situation. Only three of the class III children took note of and innovatively decorated all the walls of the box; the rest focused on the two largest walls. The children did not use all the available materials. They most willingly used crayons, explaining that it was a box devised to keep them in.

All the children, however, were proud of their projects, praised their peers and asked for an exhibition to be organized. Therefore, as Kubicka claims (2003, p. 215), the teacher should increase the sense of success and provide energy for further creative activities. The task strengthened the students' sense of agency and their sense of control over the environment; it showed that they have the developmental potential to change their environment, create their own solutions and create projects and prototypes. Designing involves the search for alternative strategies to solve a problem and requires creative, as well as logical and critical, thinking. Students, who are normally handed ready-made products in their lives, do not usually have a chance to creatively solve this type of task.

At school, students should have many opportunities to carry out work based on the analysis of the technical environment and to create projects improving the functioning of people in the environment (this is confirmed by the research of Jan A. Jelinek, 2018). Children are capable of design thinking and can design items such as school waste bins, backpacks for research trips, shopping bags, school doorstep shoe mats and information boards in school corridors. The teacher – as the originator of the students' activity based on designing – should believe in the students' participatory potential, teach them to take risks and accept new tasks.



*Photo 9.* Pokemon project



*Photo 10.* Works of packaging designers

## Research conclusions

- The research confirmed the attractiveness of a designed play space and the proposed developmental and didactic tasks in the “BEYOND THE THRESHOLD – explorers’ expeditions” project.
- The atmosphere of cognitive curiosity and activities with the use of unusual teaching aids encouraged the students to undertake individual and team activities.
- When designing games and developmental tasks, the teacher should support the development of the pupil’s subjectivity, develop their independence in thinking and acting, efficiency, and teamwork skills, as well as create conditions for them to grow in the peer community.
- Depending on the composition of the student team (regardless of age), social relations between the children were varied and ended with either a joint performance of a task or a quarrel, accusations, insults or lack of success.
- Well thought-out tasks influenced the results of the constructed structures and projects, although the students most often copied the ideas of their peers. Probably, in educational practice, there are too many ready-made solutions, schemes of action and similar works in which students do not have the opportunity to be flexible in thinking and acting.
- Although the scope of the research was not extensive, it can be assumed that the teacher, if they see that the students mis-analyze the problem

and have no ideas for solving it, should be patient and give them time. Such refraining from helping gives children time to make mistakes, search, negotiate, argue and choose from many different options. This mobilizes children's resources, teaches them to listen to their peers' ideas and to take into account other points of view, as well as to appreciate others.

- Teacher-designed original construction and project activities inspire students to discover their peers' talents and appreciate their skills.
- Observing the students performing developmental tasks enabled the teachers to gain knowledge of how activities vary depending on the organization of the task. It was much more difficult for the students to perform tasks in peer teams. Probably, school practice does not encourage children's communal learning.
- Observation of children in play and design-based activities allows for broadening the analysis and, for example, determining the creative tendency of children and recognizing their talents. For this purpose, tools developed by Kubicka (2013) – OBS DOM and OBS PRZEDSZKOLE – can be used.

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