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Abstract

Keywords:

embodied cognition activities, early language education, preschoolers, language acquisition, preschool education

Embodied cognition activities involve active interactions that train the motor system, the perceptual system and physical interactions with the proximal environment. In the language education of young preschoolers, these types of activities train young preschoolers in the process of learning new words, their comprehension and correct pronunciation. The article presents the influence exerted by the „Integrated exploitation of sensory-motor stimuli” educational program with an emphasis on capitalizing on embodied cognition activities, in the early language education approaches of small preschoolers. Early language education through this type of activity proves effective because it encourages children to make connections between words and concepts using tactile, visual and motor experiences. This approach helps to develop strong connections between words and their meanings. The methods used were the observation of the language behavior of the preschooler and the psychopedagogical experiment method, and the applied research tools, the observation grid of the language behavior of the preschooler and the educational program „Integrated exploitation of sensory-motor stimuli”. The study involved 98 small preschoolers, aged between 3 and 4 years, from 3 state preschool education units, from the urban and rural areas of Hunedoara County. The three educational units involved in the research are: „Mircea Sântimbreanu” Secondary School Brad, „Flore de Colț” Extended Program Kindergarten Brad and „Crisçior Extended Program Kindergarten”.

Zusammenfassung

Schlüsselworte:

verkörperte kognitive Aktivitäten, frühe Spracherziehung, Vorschulkinder, Spracherwerb, Vorschulerziehung

Verkörperte kognitive Aktivitäten beinhalten aktive Interaktionen, die das motorische System, das Wahrnehmungssystem und physische Interaktionen mit der proximalen Umgebung trainieren. Bei der Spracherziehung junger Vorschulkinder trainieren diese Arten von Aktivitäten junge Vorschulkinder im Prozess des Erlernens neuer Wörter, ihres Verständnisses und der korrekten Aussprache. Der Artikel stellt den Einfluss dar, den das Bildungsprogramm „Integrierte Nutzung sensorisch-motorischer Reize“ mit Schwerpunkt auf der Nutzung verkörperter kognitiver Aktivitäten auf die Spracherziehung junger Vorschulkinder ausübt. Der Sprachunterricht durch diese Art von Aktivität erweist sich als wirksam, da er Kinder dazu ermutigt, mithilfe taktiler, visueller und motorischer Erfahrungen Verbindungen zwischen Wörtern und Konzepten herzustellen. Dieser Ansatz hilft, starke Verbindungen zwischen Wörtern und ihrer Bedeutung zu entwickeln. Als Methoden kamen die Beobachtung des Sprachverhaltens des Vorschulkindes und die psychopädagogische Experimentiermethode zum Einsatz, als angewandte Forschungsinstrumente das Beobachtungsraster des Sprachverhaltens des Vorschulkindes und das Bildungsprogramm „Integrierte Ausnutzung sensomotorischer Reize“. An der Studie nahmen 98 kleine Vorschulkinder im Alter zwischen 3 und 4 Jahren aus drei staatlichen Vorschuleinrichtungen aus städtischen und ländlichen Gebieten des Kreises Hunedoara teil. Die drei an der Forschung beteiligten Bildungseinheiten sind: „Mircea Sântimbreanu“ Secondary School Brad, „Flore de Colț“ Extended Program Kindergarten Brad und Crisçior Extended Program Kindergarten.

1. Introduction

Active sensory, motor experiences and physical interactions with the proximal environment contribute to the development of neural connections in children's brains. Through embodied cognition activities, strong links are created between sensory experiences, words and meanings, pronunciation, which strengthens the understanding and use of language in various contexts.

Identifying terms/expressions difficult for preschoolers to understand, the factors that prevent them from understanding the meaning of new words, and determining the factors that determine the poor pronunciation of new words are essential steps in the successful implementation of embodied cognition activities, helping to create a stimulating and effective learning environment that supports the language



development of young preschoolers. When children feel the texture of an object or are involved in miming and role-playing activities, these experiences contribute to better understanding and retention of associated words and concepts.

2. Theoretical foundation

The concept of embodied cognition was introduced in the 1970s and 1980s by Glenberg in 2010, Price et al. in 2012, and Winkielman in 2015. It aims to highlight how psychological processes are rooted in the human body, particularly through the use of an individual's sensory-motor experiences and social interactions, as per the work of Fuchs in 2009.

The concept of embodied cognition is an innovative research topic within contemporary cognitive science. Although there have been varying views over time on the nature of this phenomenon, the essence of the approach is that psychological processes are influenced by body morphology, sensorimotor systems and emotions (Glenberg, 2010).

Anghelache et al. (2022, p. 125) says „in preschool education, the development of language is pursued through all experiential domains, taking into account the fact that the development of speech is, at the same time, an act of knowledge and that the reality of the young child takes shape through language.”

The role of „embodied cognition” type activities is to influence the way language learning processes are approached for young children in the preschool period. These activities involve the interaction of the motor system, use the senses and involve the body in the process of learning new words, understanding their meaning and developing correct pronunciation. Emphasizing teaching and learning methods that allow students to actively participate in multiple ways in their education process is important to create an educational environment that promotes embodied learning (Ionescu & Glava, 2015).

Educational methods designed to stimulate language development in preschool children can be effectively capitalized by adopting embodied cognition activities. These pedagogical approaches focus on actively engaging the child's whole body and providing tangible physical experiences. They are characterized by interactivity and are based on promoting experimentation and movement as essential ways of learning and developing language in this age group.

Educational methods aimed at developing language among young preschoolers through

embodied cognition activities provide engaging and effective means of stimulating language and supporting language progress. These approaches involve physical and interactive experience, which makes learning a more engaging and memorable experience for children. Through games, movement, tactile experiences and dialogues, children have the opportunity to expand their vocabulary, identify unknown words, recognize their meaning and pronounce them correctly in a natural and fun way. Customizing these methods to suit each child's individual needs and interests is essential to ensure an effective and tailored educational experience.

„During the kindergarten years, children acquire a wealth of knowledge, and speech becomes clear, correct, ensuring the intensive development of thinking” says Șargu (2024, p. 40).

Through embodied cognition activities, language development can be enhanced through the active interactions children have with their environment. Manipulating objects, exploring space, and interacting with other children or adults allow children to learn new words and concepts in a real and meaningful way. This process helps to develop vocabulary, understand the meaning of words and improve communication skills. Embodied cognition language education involves approaching thinking and problem solving in a physical context. Children are challenged to think logically to solve tasks and respond to specific challenges, which can stimulate the development of cognitive skills.

Through sensory-motor experiences and direct manipulation and interaction with objects, more effective information can be retained, and the approach to educating young preschoolers' language is effective. When a preschooler learns through activities that involve movement or sensory stimulation, such as manipulating objects or directly exploring the environment, information can become more accessible in a person's memory through the process of learning and remembering. When a child learns something new, the information is processed and stored in their memory. As this information is reviewed and reinforced through repetition or practice, it becomes more readily accessible in long-term memory. In other words, the information becomes „learned” and is stored in long-term memory, and can be accessed when needed for retrieval and use in different contexts or situations. So the process involves both learning and subsequent accessing of information from memory.

By regularly participating in embodied cognition activities, children can understand terms identified as difficult and correct their pronunciation. These activities involve children in their own learning process by participating in well-planned simulation games and applying techniques that focus on perception and movement, with an emphasis on visual, auditory and tactile aspects.

Active participation of young children in activities involving movement and stimulation of the senses can increase their motivation and involvement in the learning process. Sensory-motor experiences can make the learning process an enjoyable and interactive experience, which encourages young pre-schoolers to be engaged and focused on the subject matter.

Language education approaches through embodied cognition activities involve the integration of physical and sensory experiences. This type of integration is based on the connection between body and language.

3. Research methodology

The following question was sought to be answered:

Can the educational program „Integrated exploitation of sensory-motor stimuli” focusing on embodied cognition activities influence the early language education approaches of small preschoolers involved in the research?

In the research, a within-subjects research design was adopted, in which only the experimental sample was involved, without a control group. The research sample consists of 98 preschool children, 52% girls and 48% boys, attending the small group of three educational establishments: „Mircea Sântimbreanu” secondary school Brad (30.6%), „Floare de Colţ” Brad extended program kindergaten (41.8%), and „Crişcioc extended program kindergarten” (27.6%). Parents of preschoolers were informed about their children's participation in this study, and the confidentiality of the data provided was guaranteed.

The method used was observation and the research instrument applied was the observation grid of the preschooler's linguistic behaviour to identify level of word comprehension and to discover the quality of word pronunciation in spontaneous speech, before and after participating in the educational programme.

The psycho-pedagogical experiment method was used in the experimental phase. This involved the

application of the educational program „Integrated exploitation of sensory-motor stimuli” focused on embodied cognition activities.

The educational programme involved ten interactive activities aimed at comprehension of unfamiliar words/expressions identified by the educators as difficult for the preschoolers to understand and activities involving spontaneous word pronunciation.

Explaining the meaning of unfamiliar words/expressions was done by reading ten stories as part of the educational programme. Each story contained words/expressions unknown to the young preschoolers, which contained the following sounds: „C”, „F”, „H”, „J”, „L”, „M”, „P”, „R”, „Ş”, „T”, inventoried by applying the observation grid. Unknown words/phrases were explained using embodied cognition interventions. Thus, the teacher organised a simulation game and the pre-schoolers physically manipulated the materials she provided. At the end of each activity, she re-read the ten stories to see if the meaning of the word/phrase was understood by the young preschoolers.

To mentally simulate the action described by the unknown words/phrases, the pre-schoolers imagined the action implied by the initial reading.

Pronunciation of the words in spontaneous speech was achieved through participation in speech games and physical manipulation of materials provided by the teacher. Together with her they looked in the mirror and carried out gymnastic movements of the phono-articulatory apparatus and breathing exercises for the correct emission of sounds, involving the neural and bodily systems of perception, action and emotion of the young children.

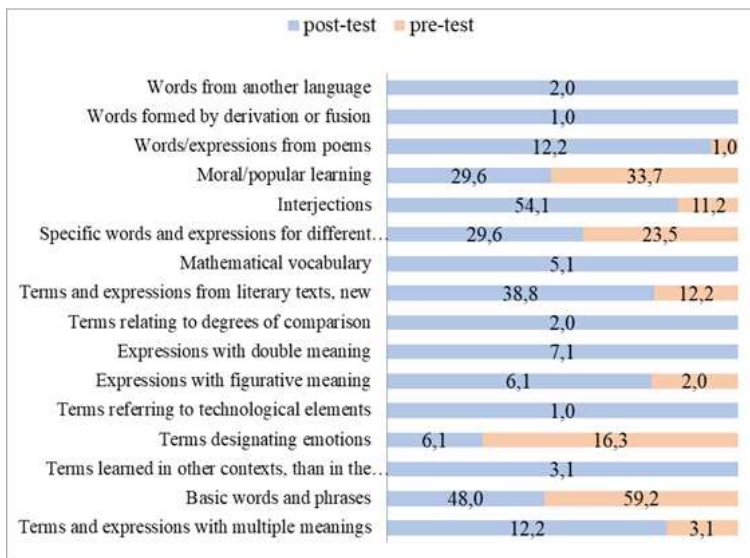
4. Results

Data collected following the application of the observation grid were processed and analyzed using IBM SPSS Statistics 20.0. The grouping and coding of the responses served to carry out the analyses from Figure 1.

In the pre-experimental stage, the most difficult terms for small preschoolers to understand were identified. Some of them refer to interjections such as „Brr”, „Buff”, „Pst”, not being very clear to them in which context they are used (54.1%), basic words and expressions which, although common, are not used very often in conversations, such as brooch, mysterious, distraught (48%), literary terms and expressions from new texts such as friends, boot,

earwig, mud, „kin of kin” (38. 8%), moral and popular teachings difficult to decipher by pre-schoolers „to lie down to talk”, „fire and pear were made”, „cheese is for money”, „jerkin”, „the little stump overturns the big cart”, „Don't go to the praised tree with your sack”, „Where the sun doesn't come through the window, the doctor comes through the door! ”, „Where there's no head, woe betide the feet”, and words and expressions specific to certain areas that put them in difficulty such as „quilted jacket”, „library”, „roll-up”, „cupboard”, „jagged”, „floor”.

Figure 1. Terms and expressions with multiple meanings



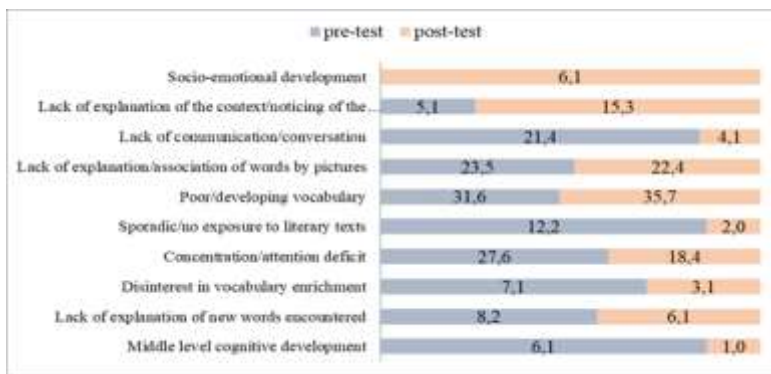
Following the intervention, the biggest changes (difference between post-test scores and pre-test scores) were observed in the comprehension of expressions involving words from the moral/popular teachings domain (+4.1%). Small preschoolers also identified and named words from the emotions domain (+10.2%). Preschoolers, following participation in the educational programme, used new, learned terms in conversations with other partners (+11.2%).

Four terms are mentioned in both the pre- and post-experimental stages, „fleoşc” (18.8%/4.3%), „splash” (12.5%/4.3%), „blockhead” (4.2%/1.4%) and „brr” (3.1%/7.2%), terms that preschoolers are likely to have encountered in other works. The most frequently mentioned moral/popular teachings in the pre-experimental stage are „keep an eye aut” (6.3%), „get in trouble” (3.1%), „rain bucket” (3.1%), „mindful” (2.1%), „uplifting thought” (2.1%) or „take shelter” (4.2%), „sit” (3. 1%), while in the post-experimental stage the preschoolers list „to get over your head” (7.2%), „I get stuck” (7.2%), „to learn mind” (7.2%), „early childhood” (2.9%), „to meci” (2.9%) respectively „muddle” (2.9%), „dug” (2.9%).

Table 1. Examples of identified terms/expressions difficult for small preschoolers to understand

	Pre-test	Appearance	Post-test	Appearance
1	Fleoşc	18.8%	Brr	7.2%
2	Splash	12.5%	„To screw up”	7.2%
3	„Keep an eye aut”	6.3%	„I'm getting stuck”	7.2%
4	Very big man	6.3%	Diligent	7.2%
5	Snow	5.2%	Capricious weather	7.2%
6	Brooch	5.2%	Alinated	7.2%
7	Buff	5.2%	„Get a grip on yourself”	7.2%
8	Blockhead	4.2%	„In vain”	7.2%
9	Freak	4.2%	Fierce	7.2%
10	Bâzz- bâzz	4.2%	Fleoşc	4.3%
11	„Take shelter”	4.2%	Splash	4.3%
12	Brr	3.1%	Meadow	4.3%
13	„To make trouble”	3.1%	Very big man	2.9%
14	Mysterious	3.1%	„Weave cloth”	2.9%
15	„It's raining buckets”	3.1%	Silky	2.9%
16	„To sit down”	3.1%	Spider web	2.9%
17	Carefully	2.1%	„To match”	2.9%
18	Giddy	2.1%	„Tender Baby”	2.9%
19	Blushed	2.1%	Booth	2.9%
20	„Uplifting Thought”	2.1%	Blockhead	1.4%

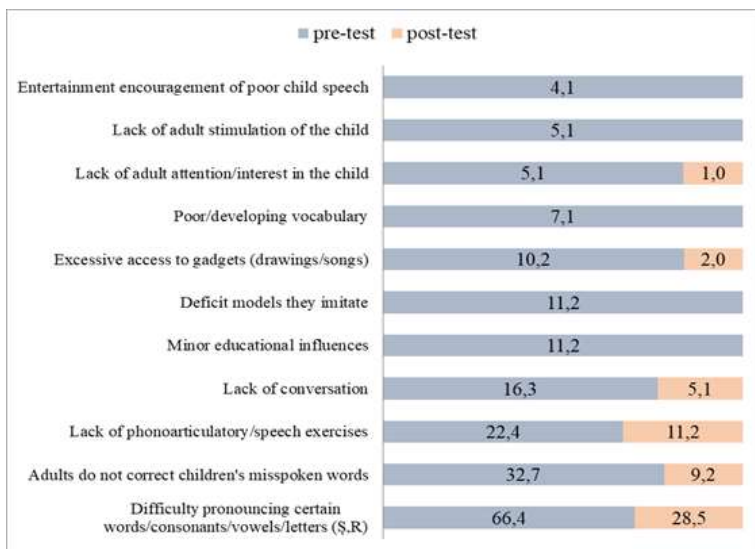
Figure 2. Factors that prevent small preschoolers from understanding the meaning of new words



At the pre-experimental stage, the frequency of factors that prevent small preschoolers from understanding the meaning of new words are: poor vocabulary in the developmental stage (31.6%), lack of concentration and attention from children (27.6%),

lack of explanation/association of words through pictures (23.5%) and lack of parent-child communication/conversation (21.4%). Following the application of the educational programme „Integrated exploitation of sensory-motor stimuli” focused on embodied cognition activities it is observed that the action of the factors preventing preschoolers from understanding new words is reduced (difference between the scores obtained in the pre-experimental stage and the scores obtained in the post-experimental stage). Thus, in the post-experimental stage, the emphasis is on decreasing the lack of parent-child communication/conversation (-17.3%), sporadic exposure to literary texts (-10.2%), lack of concentration/attention to activities (-9.2%), decreasing disinterest in vocabulary enrichment (-4.1%) as well as accessing a new level of cognition (-5.1%).

Figure 3. Factors leading to poor pronunciation of new words in small preschoolers



At the pre-experimental stage, the most frequent factors leading to poor pronunciation of new words in small preschoolers are difficulties in pronouncing some words/consonants/vowels/letters, especially „S” and „R” (66.4%), mispronouncing words (32.7%), lack of phonoarticulatory exercises and diction (22.4%), poor communication or even lack of parent-child conversation (16.3%), minor influences or poor patterns they imitate (11.2%) and last but not least excessive access to gadgets (10.2%).

Following the participation of small preschoolers in the educational program „Integrated exploitation of sensory-motor stimuli”, major decreases (difference between the scores obtained in the pre-experimental stage and the scores obtained in the post-experimental stage) are observed in the frequencies of the variables represented by: poor pronunciation of

words/consonants/vowels/letters („S”, „R”) that put preschoolers in difficulty (-37.9%), adults' non-involvement in correcting children's mispronounced words (-23.7%), lack of phonoarticulatory and diction exercises for clearer pronunciation of words (-11.2%), lack of parent-child conversations (-11.2%), reduction of minor educational influences and poor models they imitate (-11.2%) and decreased access to gadgets (-8.2%).

5. Discussions

To ensure that we obtain reliable and meaningful results, it would be beneficial to extend the duration of the study to monitor the long-term impact of the educational program on language development. This approach would allow us to observe changes and trends over time and better assess the effects of the program.

It would also be advisable to diversify the language education activities included in the program. This could include adopting different teaching and learning strategies as well as integrating modern technology and other additional resources to encourage children's participation and engagement in learning.

To ensure that our results are relevant and applicable to a wider range of contexts, it would be necessary to expand the sample of participants. This would involve recruiting a larger number of children from diverse socio-economic and cultural backgrounds, which would allow us to examine the effects of the program in a wider variety of settings and obtain more representative data.

6. Conclusions

Embodied cognition activities involve small preschoolers actively interacting with content to train the motor system, the perceptual system, and to physically interact with the environment in the process of learning new words, recognizing their meaning, and pronouncing them correctly. The manner in which these types of activities are carried out influences the way in which the language of small pre-school children is educated. They encourage children to make associations between words and concepts using tactile, visual and motor experiences, helping to develop strong connections between words and their meanings.

The responses analysed from the preschool language behaviour observation grid highlight terms/expressions identified as difficult for young preschoolers to understand, factors that directly

influence their approaches to understanding the meaning of new words and poor pronunciation.

If in the pre-experimental stage, factors, terms/expressions difficult to be understood by young preschoolers were identified, in the post-experimental stage, the improvements brought about by the application of the educational programme „Integrated exploitation of sensory-motor stimuli” focused on embodied cognition activities.

The terms/expressions identified as difficult for small preschoolers to understand refer to moral/popular notions/expressions/teachings that they have never encountered before, the limited cognitive level of identifying and naming the emotions they encounter during a day.

Factors that lead to mispronunciation include: difficulties pronouncing words, consonants or vowels, mispronouncing words and poor parent-child conversation.

Factors that prevent small preschoolers from understanding the meaning of new words refer in particular to preschoolers' limited vocabulary, concentration and attention deficits, lack of word-picture associations and parent-child conversation.

This research addresses an unmet need in the education by focusing on the use of embodied cognition activities to improve comprehension and pronunciation of new words among young preschoolers. Until now, preschool education has often been focused on traditional methods that do not put enough emphasis on sensory-motor aspects and on children's active interaction with the contents.

By introducing and implementing this educational program, study brings an innovative approach that focuses on the integral development of children through tactile, visual and motor experiences. This approach is an effective way to help small preschoolers make strong connections between words and their meanings in a way that allows them to actively engage and exercise their motor and perceptual systems as they learn.

The study also brings into focus the factors that influence poor understanding and pronunciation of new words among young preschoolers, thus identifying the specific problems they face and providing concrete solutions to address them.

Therefore, by addressing an unmet need in the field and providing an innovative and effective solution, this research has the potential to significantly

improve language learning and development among small preschoolers. By using embodied cognition activities, teachers can provide preschoolers with active learning opportunities and hands-on experiences that facilitate understanding and retention of information.

Educators can develop personalized educational plans that specifically address the learning needs of preschoolers, focusing on comprehension and correct pronunciation of words in an interactive and engaging way. By understanding the individual needs of preschoolers, teachers can adapt their activities and provide additional support in areas where they are struggling.

Thus, the educational program „Integrated exploitation of sensory-motor stimuli” focused on embodied cognition activities had a beneficial influence on the small preschoolers involved in the study.

Authors note: The authors have equal contributions to this article.

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