

Висновок. Підвищення ефективності рівня підготовки учня залежить від якості процесу навчання. Серед шляхів вдосконалення процесу навчання, на сучасному етапі розвитку освіти в Україні є: використання метакогнітивних стратегій; застосування опорних знань та навиків; використання інноваційних технологій навчання; реалізація принципу прикладного навчання; розвиток мотиваційної сфери діяльності учнів; організація ефективної самостійної діяльності; розподіл учнів з різними природними можливостями по групах.

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**NUMIKON'S METHODOLOGY IN THE WORK OF EDUCATOR
WITH CHILDREN WITH SPECIAL EDUCATION NEEDS**

The article theoretically substantiates the UK's Numicon Schooling Program. The program's system of action, methods and forms of work are described. The article highlights the effective activities of the Numicon program for children with special education needs. One of the main key concepts in mathematics teaching for children studying in an inclusive environment with the help of didactic material from the Numicon block is considered. The authors of the article concluded that the introduction of the Numicon methodology promotes better mastering of material in the discipline of mathematics not only for children with special education needs, but for the whole class.

Keywords: child with special educational needs; Numicon; inclusive education; pedagogical correction.

Learning mathematical language often presents difficulties for children because, in the course of mathematics lessons, words which are familiar to children outside the classroom, are used in unfamiliar contexts. Familiar word taken on different and unfamiliar shades of meaning. For example, 'take-away' in a non-mathematical context describes a meal collected from a fast food outlet, whereas in the classroom it describes a subtraction structure. This programme has been designed specifically for:

- students of any age who are experiencing significantly greater difficulty learning mathematics than the majority of students of their age;
- students who are working well below the level expected of their chronological ages [1].

We can say the following: 1) to shape the child's concept of number, you must represent numbers as large as possible a number of ways; 2) when meeting with numbers needs to be involved different channels of perception, that is, different bodies feelings. And for best results, it is necessary to connect and touch and hearing, and kinesthetic approach; 3) it is necessary to create a supportive environment, that is, to make classes more interesting and enjoyable for the child and to note even the slightest progress and achievements. With this approach in children increases confidence in their forces and formed the incentive for further lessons [7, p. 18-19].

A feature of this system is a flexible and at the same time comprehensive approach to the education of children. Numicon is a universal educational program that can give a child initial knowledge of mathematics, geometry, logic, develop his imagination, using special template materials.

The monographs, dissertations other scientific works largely cover: the content and features of training, preparation for life of children with disabilities (T. Bilous, I. Dmitrieva, V. Zolotover, I. Kovshova, A. Kolupayeva, V. Lipa, L. Odinchenko, V. Tarasun); organization of social and pedagogical work with children and youth with disabilities (I. Ivanova, V. Lyashenko, O. Molchan, V. Teslenko). The whole history of special pedagogy can be

presented as a history of development of the theory and practice of correctional work. The well-known correction systems and concepts are: E. egen (1812-1880), M. Montessori (1870-1952), O. Decroly (1871-1933), L. Vygotskyj (1896-1934), O. Graborov (1885-1949) and others.

The analysis of the scientific literature showed that in the theory of correctional education, the peculiarities and stages of the use of materialized means of clarity in activities with children with disabilities of psychophysical development were not fully investigated, and the issues of teaching mathematics to preschool children with special needs remained relevant (N. Gavrilova, V. Tarasun, L. Fomichev, N. Lopatina and others).

The aim of this article is to identify ways of selecting and implementing the Numicon methodology in the educational process for children with special education needs in secondary education.

When a child begins to learn count, he first remembers 'words for counting', or 'counting sequence', and how to pronounce numerals from one to twenty in the correct order. For this, a sufficiently developed short-term memory is needed - words need to be learned and kept in mind in a certain order, and only then they begin to be used to count real objects. Gradually mastering the skill of counting objects, children begin to understand what we count in order to find out "how many are there?" Realizing that the last numeral uttered when counting objects exactly means "how many?" masters such a concept as "the power of the multitude". Thus, he understands that each numeral denotes a certain number.

Numicon is a program for developing mathematical skills in children using a multi-sensory approach and using special sets of visual and practical material. This program was developed in England in 1996-1998. It is aimed at children who have difficulty in learning mathematics. Using the Numicon program enables you to engage the strengths of young children and their ability to learn hands-on, learn to observe, and to recognize patterns, that is, to memorize, and then to recognize standardized patterns or patterns in subsequent performances. Numicon numbers from 1 to 10 are represented by plastic templates of different colors, making them accessible for visual and tactile perception (Fig 1.1.).

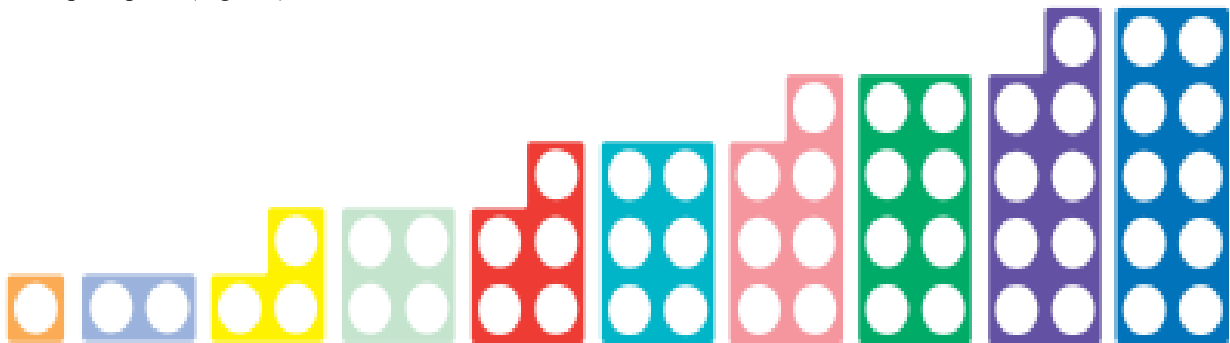


Fig1.1. The Numicon shapes of numbers

The set includes: Numicon forms - 32 parts; multicolored pegs - 52 parts that can be used as counting material, to be inserted into the holes of the shapes, for the presentation of the sequence, orientation on the plane; white board with bubbles for training; "Magic Bag" for searching at the touch of the specified object or form; brochure - a guide for parents; plot diagrams for overlaying on the board - 2 pcs.; a set of Numicon cards from 0-10; clamshell book with pictures and numeric ruler; 3 laces. This is a set for work together, there is a larger set and other names. Numikon forms are arranged so that children can manipulate them, learn to recognize patterns and correlate them with the appropriate numbers. The authors of this program are convinced that it is important to use as many channels of the child's sensory perception as auditory, visual, tactile, and to connect movement and speech in this process.

Doing mathematics involves communicating and thinking mathematically – and these are two sides of the same coin. We think in the same ways that we communicate, and communicate in the same ways that we think. As children learn to communicate mathematically, they learn to think mathematically. This involves them in the following (Fig.1.2.):

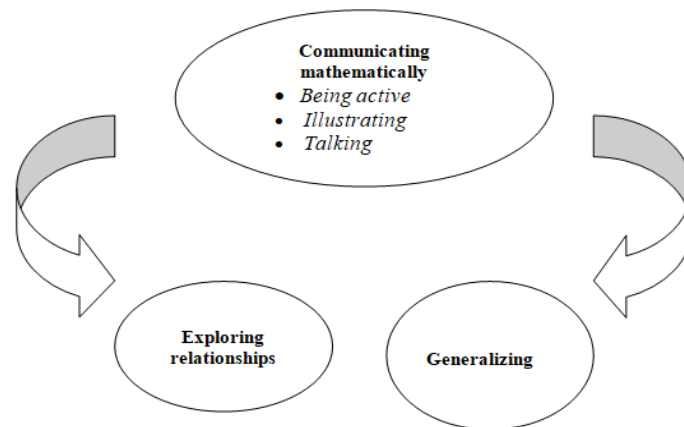


Fig.1.2. The process of mathematical learning

Being active: Teaching and learning with Numicon requires children to be active. This does not only mean being physically active (e.g. fitting physical objects together, finding a number on a number line, drawing a shape), but is a requirement reflecting the understanding that mathematics itself is activity: mathematics is something children are learning to do.

Illustrating: Doing mathematics (i.e. thinking and communicating mathematically) necessarily involves illustrating, because mathematics is about studying relationships between objects, actions and measures, and it is impossible to explore such relationships without some kind of spatial imagery being involved. Even when thinking about just two numbers, one of them ‘comes before’ the other one on a number line or is said to be “bigger” or “higher”; these relations all involve spatial imagery.

Talking: Since doing mathematics involves communicating mathematically (both with others and with ourselves), doing mathematics also involves talking. Talking is an essential aspect of all Numicon activity.

Stages of work with Numicon

Initial stage – sensory stage (experience accumulation and sensory saturation).

The goal of Numicon methods is to form a visual and tactile representation of Forms, Numicon details.

The initial phase of acquaintance with Numicon presupposes that children manipulate and play with Numicon details: they look at them, twist in their hands, put their fingers on, catch a net of water; used in story games; string Numicon forms or necklace pins; paint and reflect on paper; extruded on dough play.

All this is necessary for the children to look and take in the details of Numicon as much as possible and thus memorize them visually and tactfully.

Stage II - Characterization of Forms.

Children learn that the details are different in color and size, that each form has a different number of holes. Details can be described by words such as “red”, “blue”, “big”, “small”. They can be called “three”, “five”, “seven”, etc. However, at this stage, we do not suggest that children list the number of openings in each form. All details are perceived holistically, globally. And the words “three”, “five”, “seven” are so far only the names (names) of yellow, red and pink, respectively.

When children begin to design various Numicon Forms (paths, houses, cars, animals) on a pattern, they impose details on a white board, trying to form one large shape of two or more smaller Forms. At this stage, the children are introduced to a new property – Forms can be docked, placed next to.

Stage III – Form – numeral – number.

We suggest that children compare Forms in size and put them in a row from the smallest to the largest. At the same time, children become familiar with the numbers and work with the numerical series. Children learn to match numbers and Numicon Forms based on their holistic perception, without listing holes.

Stage IV – Figure.

We suggest listing the holes, inserting pegs, pebbles, beans, etc. into them. and list how many are in each Form.

V stage – Arithmetic.

We use Numicon as additional visual material when familiarizing ourselves with arithmetic, such as adding. To calculate example $5 + 2 = 7$, we take Form-5 and attach to it below Form-2, received a Form that is similar to Form-7. To check the result, we take Form-7, impose on top and make sure that it turned out 7. Put the appropriate example. Form a mathematical speech: 5 plus two equals 7 or 5 add 2 will be seven [3, p. 84-90; 8, p. 23].

Numicon also allows you to perform arithmetic operations with a transition in ten.

When children manipulate parts, look for them in macaroni, touch them in a “magic pouch”, play with them, close their eyes, compare, select appropriate figures, they gradually form not only visual and tactile representation of these forms, but also images of these Forms and corresponding figures. That is, children begin to imagine Numicon Forms and Numbers and then act on them without having real details in front of their eyes [2].

With the help of Numicon details, you can clearly demonstrate the basic properties of natural numbers: each successive number is one more than the previous one; difference between even and odd numbers.

In addition, we can learn:

- The composition of the number.
- Adding.
- Subtraction.
- Addition with a jump of ten.
- Multiplication.
- Division.

Numicon structured imagery can help children to connect their different mathematical experiences both within maths itself and between everyday mathematical experiences and classroom learning.

Numicon Pedagogy offers to child:

- Communicating mathematically with self and others;
- Generalising and doing mathematics with self and others;
- Our mathematical communicating is where we make our ‘numbers’...simply and with a structure of;
- Calculating involves telling new stories about numbers;
- New stories come with the help of illustrations;
- Action, Imagery, Conversation;
- Inclusive [4].

Conclusion. The methodology of Numicon is a kind of bridge that allows children to relate abstract mathematical concepts with a real tangible object from the familiar world. During training, children visualize the pattern, hear its name and pronounce it. All templates have a different shape and color, which involves the sensory capabilities of the baby in the educational process. Digital templates are supplemented with special pins, working with which the child develops fine motor skills that have a positive effect on his speech and intellectual development.

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FOREIGN LANGUAGE IN TECHNICAL UNIVERSITY: COMPETENCE-BASED APPROACH

The article presents the analysis of the concept of competence-based approach in the education system, the competence-based approach importance in foreign language teaching within technical university is discussed; the graduates' key competencies are enumerated; the main competence-based approach characteristics of future engineers' language proficiency are emphasized.

Key words: competency, competence-based approach, engineering education, foreign language teaching, professionally-oriented communicative competency.