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CERTAIN PECULIARITIES OF MEMORY DEVELOPMENT IN ADULTS: TEACHING TECHNOLOGIES FRAMEWORK

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In this article is addressed the problem of developing certain mental processes in adults, emerging from the particularities of their manifestation at a respective age, the emphasis being on the development of memory. It should be noted that the problem is approached from the perspective of valorizing didactic technologies with the most significant formative values for the development of a certain mental process, in the given case of memory. Interactive didactic technologies and, first of all, those specific to this process are proposed.

Keywords: *didactic technologies, mental processes, perception, memory, methods and procedures, adults, non-formal education.*

UNELE PARTICULARITĂȚI DE DEZVOLTARE A MEMORIEI LA ADULȚI: CADRUL TEHNOLOGIILOR DIDACTICE

În articolul dat se abordează problema dezvoltării unor procese psihice la adulți, reieșind din particularitățile manifestării acestora la o vârsta respectivă, accentul fiind pus pe dezvoltarea memoriei. E de menționat că, problema se abordează din perspectiva valorificării tehnologiilor didactice cu cele mai semnificative valențe formative pentru dezvoltarea a unui anumit proces psihic, în cazul dat al memoriei. Se propun tehnologii didactice interactive și, în primul rând, cele specifice acestui proces.

Cuvinte-cheie: *tehnologii didactice, procese psihice, percepție, memorie, metode și procedee, adulți, educația nonformală.*

Introduction

In the analysis of recent specialized literature, several contradictory trends are attested in the development of education, in general, and non-formal education of adults, in particular.

On the one hand, the emphasis is on valorizing on the concept of lifelong education, on the formation of key competences, including sustainable ones, on the other hand, there is evidence of a decrease in motivation and interest in learning among several social groups, including adults.

At the same time, another phenomenon is witnessed in those who are involved in one form or another in training and education, namely: the low level of perception of the study material, memory and thinking, as well as attention in the learning process. It is known that the level of developing these mental processes determines the quality of learning and, as a result, the formation of

learners' personality. In this context, it is found that, in the education process at all levels (formal education and non-formal education), trainers emphasize the formation of cognitive competences and do not apply in practice technologies directly oriented to the development of perception, memory, attention.

The purpose of the given article is to propose a set of didactic technologies regarding the development of memory in adults.

Didactic Technologies: Transfer to Area of Developing Adults' Mental Processes

It should be noted that the evolution of "didactic technologies" concept is a spectacular one: from the understanding of didactic technologies as the application of technical means in education, to the understanding of didactic technologies as a branch of education sciences and as a component of the modern education paradigm (*see* Fig.1).

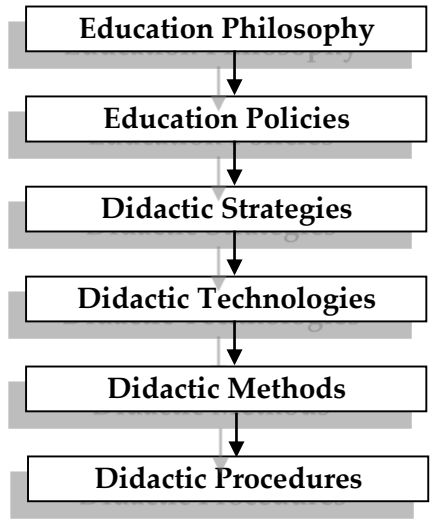


Figure 1. Didactic Technologies in Structure of Modern Education Paradigm

Instructional technology is a complex, integrated process, including learners and teachers, procedures, ideas, tools, and organization for problem analysis, instrumentation, implementation, evaluation, and monitoring of problem solutions regarding all aspects of learning.

Didactic technology is always approximate, conventional, with the hint of recommendation, which makes it possible to use various variants of concrete solution to the problem. Didactic technology can be interrupted starting from the tasks of carrying out the instructional process; didactic technology cannot be repeated exactly, although it is not excluded that conditions and premises are similar to the previous ones.

Studying the opinions of different scholars, I came to the conclusion that the essential characteristics of didactic technology are the following:

- diagnosis and effectiveness express the key positions of didactic technology characteristic, as well as the achievement of goal and the effective provision of training process;
- correcting the didactic technology implies the possibility of conducting feedback, oriented towards well-defined objectives;
- updating didactic technology – didactic innovations on the one hand and continuous improvement on the other, in order to minimize the discordance between the latest investigations in science, production, life and their reflection in study objectives and purposes;
- scientific character of the didactic technology – abandoning the intuitive determination of the content, methods and forms of training, the transition to postmodern innovations of science;
- reproduction of the learning process through didactic technology and the results of this process or the tendency to obtain similar results, using a certain technique in the training process and other relatively constant factors;
- didactic technology involves programming the activity of learners and teacher;
- didactic technology involves the use of technical means of instruction and didactic material, methods that intensify the learning activity of adults;
- didactic technology generates the optimal curricular framework of training process and the complex solution of basic educational problems;
- didactic technology generates qualitative and quantitative application of learning results [1, p.182-184].

The above-mentioned characteristics are general and can be successfully used in any educational process, including the development of mental processes in adults, including the development of memory.

Developing Memory in Learners: Specific Methods and Techniques

The selection, adaptation and application of didactic technologies, including specific ones, starts from establishing the particularities of memory in adults, which are represented as follows:

- memory qualities (volume, suppleness, fidelity) are dependent on the structure of life demands, the use of mnemonics, memorization strategies;
- mechanical memory decreases after 40 years, and short-term memory after 50 years, but ideas are retained even after 60 years, thanks to their own "semantic anchors";
- fixation and retention have a greater "longevity", compared to recognition and reproduction which register a slight decrease after 55 years;
- professional identity influences and gives a certain meaning to life.

It should be noted that the classical and interactive methods can be oriented and adapted to the development of learners' memory. But we will try to present you some methods and techniques as components of didactic technologies specific to memory development in learners.

As a mental process, *memory* consists in imprinting, recognizing and reproducing sensations, feelings, movements, knowledge, etc. from the past [2]. Memory can be short-term and long-term, visual and auditory.

The human brain consists of 20 billion nerve cells, capable of memorizing 86 mln. bits of information. Towards the end of life, our memory contains 100 trillion bits of information. In one and the same unit of time, the eye's storage capacity is 3 million bits, while the ear's — only 20 bits. The brain only needs 1/20 sec. for recalling the notified face in general terms. In the printed text, the information content does not exceed 25%. The amount of information, received involuntarily by receivers — is 1077 bits/sec.:

- *The amount of information, consciously received by the sense organs — 107 bits/sec;*
- *the amount of information, which "gets" in the short-term memory — 0.5~0.7 bits/sec;*
- *the amount of information, which is "stored" in the long-term memory — 0.05 bits/sec.*

Long-Term Memory:

1. Volume of long-term memory when presenting material — 5—20 bits.
2. Storage capacity — 10-70 bits/sec.
3. Reading text in mind — 45 bits/sec.
4. Reading aloud — 30 bits/sec [3].

This information is useful regarding the design and implementation of the learning process, including the process of memory development in learners, applying the following methods and techniques specific to this process.

Table 1. Methods and Techniques Specific to Process of Adult Memory Development

No. Crt.	Objectives	Methods, Procedures, Techniques
1.	Formation of Functional and Operational Mechanisms of Memory	• Agenda • Invitation to Walk • Walking with a "Suitcase" • Simonides' Method • Cicero's Method • Mnemonic Procedures: *First Letters; Mnemonic Sentences; Lyrics; Associations; Logical-Structural Schemes* • Etc.

The application of these methods in the framework of adult learning is carried out along two interrelated training lines:

a) the attribution of these methods and the cognitive training functions of adults in the learning process, along with the motivational function of memorizing the studied subject;
b) the direct exploitation of functions of these methods for developing memory in adults.

As a rule, in this sense, the respective methods are applied in pauses between the application of different cognitive training methods as constructive and deepening didactic inserts.

Therefore, in the formation of functional and operational mechanisms of memory, we propose the following methods and procedures:

1. ***Agenda.*** It is recommended that for each learning activity written on the fourth part of the sheet, folded in two, on one side - the new concept, and on the other - its definition. It is necessary to collect these separate sheets in the pocket. Glancing at them before sleep, in the morning and before classes – is enough to get pleasure from the learning process.
2. ***Invitation to Walk.*** For this, in your walking suit, there must always be a pocket, in which a certain information bank must be kept. This method is very effective in acquiring the necessary professional notions. For this, it is required to make cards the size of a quarter of the paper sheet. On one side of the sheet write the notion - for example: "*steel*", and on its reverse side - the explanation of this notion - alloy of iron and carbon, in which the carbon content does not exceed 2.14%. It is best to compile these sheets in the evening. Having compiled sheets with the content of the learned material, put them in your pocket. In the morning, assimilate them once more. You can still study them, say, on the way to work, lessons.

   Take a look at the sheets if you have some free time – shuffle them and study them again. Thus, in a week you will master the basics of the future profession, you will create the knowledge base.
3. ***Walking with a "Suitcase"***. From now on, on the road it is recommended to take a slightly heavier bag, and again sheets - lesson handouts. In the evening, after the expiration of 8-9 hours from the lessons (*it must be remembered that this is the optimal period for repetition*) fill in the lesson sheet, the size of which can be the size of a notebook sheet, fold the sheet and write the number of the lesson on it and the subject, and on the anterior side – the entire content of the lesson reflected in the form of basic signals and basic outline.
4. ***Simonides' Method*** – the information to be memorized is necessary to place in a room of a well-known apartment. To recall the information, it is enough

to go through the given room several times.

5. ***Cicero's Method*** – it is used when the information must be memorized in a strict sequence. It is necessary to choose a well-known route and distribute the information necessary for memorization according to the chosen route. To recall the information, it is enough to go along this route.
6. ***Mnemonic Procedures:***
   - *First Letters.* The information to be memorized must be "compressed" until certain words are defined. After that from the first letters of these words to compose a single "mnemonic word".
   - *Mnemonic Sentences*. The information to be memorized is required to be structured by the first letters in the form of abstract sentences.
   - *Poems*. Poems are made from the information to be memorized.
   - *Associations*. Information for memorization must be presented in the form of an association with an already known phenomenon in life. To remember the necessary information, it is enough to remember the association.
   - *Logical-Structural Schemes*. The algorithmic transcriptions of the components of logical-structural schemes: (1) highlighting the parts of the subchapter or the elements of the studied matter; (2) showing and fixing the links between them; (3) highlighting key words and basic (benchmark) words; (4) highlighting in the system the main and the complementary; (5) making a concrete illustration; (6) in order to improve the memorization of the logical-structural scheme, abbreviations and conventional signs are used to the maximum [4].

The German scientist F. Lezer proposes another group of effective methods and procedures for memory development, identifying six phases of memory: perception; concentration; reproduction; recapitulation; forgetting; reminder [5].

Perception: establishing clear and accurate cognitive goals: multilateral and intensive use of analyzers; maintaining interest by using acquired knowledge.

Concentration: orienting the cognitive process towards the object of knowledge by focusing attention.

Reproduction: the correct choice of cognitive links between new information and information already stored in memory; using relevant links.

Recapitulation: repetition of information over optimal periods (20 sec.; 15-20 minutes; 8-9 hours).

Forgetting (memory's functioning mechanism, which allows information to be stored in long-term memory): determining the information to be forgotten; repeating and printing the remaining information; determination of verbal benchmarks; for forgetting — resorting to evasion.

Remembering: determining the revealed links: starting the recall from the benchmark; optimal use of benchmarks:

- trying to learn the proposed methods and procedures;
- the use of these rules and procedures in one's own teaching or learning practice.

Mastering the operational mechanisms of memory allows us to:

- increase the speed of memorization and reminders;
- increase the volume of long-term (durable) memory;
- increase the accuracy of memorization and remembering;
- increase durability.

The application of different methods and procedures for organizing and analyzing the study material contributes to memorization and leaves rich imprints on the memory.

The use in adult learning of the rules and procedures proposed by F. Lezer, and the procedures for forming the operational mechanism of memory, allows the considerable activation of the training process and, in particular, the reproductive component of learning [6].

How to develop mnemonic capabilities in the training process:

1. Do in the learning process breaks for memorization.
2. Use different methods and procedures to attract the learners' attention, the ones that need to be memorized.
3. Accumulate knowledge about the development of mnemonic capabilities and use them in the learning process.
4. Consider average memory cues in organizing learning activities.
5. Consider individual memory cues in organizing learning activities.
6. Take gender and age into account.
7. Apply different types of memory in the learning process: *imaginary, logical-semantic, motor, emotional, long-term, short-term, visual and auditory*.
8. Consider the effect of active and retroactive braking.
9. Organize the material for learning: *dosage by volume, distribution over time, structuring the material by units, linguistic correctness*, etc.
10. Design the repetition of the learned material.

General Conclusions

Approaching the problem of developing mental processes in adults by means of classical didactic technologies and specific to this process is not new, but too little valorized both in the practice of formal education and in the practice of non-formal education, including in the practice of education for adults.

The given article opens new opportunities for the elaboration and valorization of didactic technologies specific to the development of other

mental processes: *perception, attention, thinking*. At the same time, the opportunities to realize the interconnection of classic didactic technologies and those specific to the development of mental processes in adults are also opened. The proposed approach can also be applied to the development of mental processes in pupils and students by adapting it to various learning contexts, taking into account their age characteristics.

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