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**FORMATION OF METACOGNITIVE COMPETENCE OF PRIMARY
SCHOOL STUDENTS THROUGH DIDACTIC COMMUNICATION**

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LIST OF ABBREVIATIONS

In Romanian:

GOC - Control Group

GE - Experimental Group

UN - United Nations

UNESCO - United Nations Educational, Scientific and Cultural Organization

OECD - Organization for Economic Co-operation and Development

PFCM – Metacognitive Competence Training Program

CONCEPTUAL MILESTONES OF RESEARCH

Timeliness and importance of the research topic. The public policy documents in the field of education reaffirm the need to focus the training approach on the subject of learning, formulating in operational terms, the orientation towards an education system centered on skills formation, leading directly to shaping a profile of the graduate for each level of study, connected, in part, to current and future realities. International bodies (UN, UNESCO, OECD, World Bank, European Union) support education as a priority area and create a supportive mechanism for all member countries to generate quality education built especially towards *inclusion, equity, tolerance, excellence, respect, collaboration, diversity, integrity and lifelong learning opportunities*.

Value axes and Strategic visions International studies in the field of education are taken over, harmonized at national level, assumed decisionally through national strategies for sustainable development and placed on the governmental agenda as mandatory measures. Within the *National Strategy for Sustainable Development of Romania 2030*, Education is seen "as a process that prepares the younger generations for the challenges of the future and runs throughout their lives, encouraging innovation, meritocracy, constructive critical thinking, curiosity, conduct and empowerment"[35, p.37]

In a similar approach, these principles are also highlighted in *Development Strategy "Education 2030"*, approved by the Ministry of Education and Research of the Republic of Moldova, which regulates formative actions from the perspective of assuming international targets in the field of education and which are focused "on the most current approaches, concepts and trends of curricular development: ensuring the unity of psychocentrism and sociocentrism, focusing on learners, designing goals formulated in terms of competences, active and interactive learning, development of critical thinking". [36, p. 15]

Global challenges are putting increasing pressure on the education system, which needs to rethink its courses of action in terms of student training and training. Focusing the education system on skills formation leads to a new dimensioning of education goals from the perspective of the direct beneficiary. Thus, the school must prepare the student so that he is capable of change at all times. This requires the subject of learning to be trained to adapt to new professions that have not yet been created, to the use of technologies that have not been invented and to solve problems to which currently no reference can be made. All these requirements regulate the formation of metacognitive competence in primary school students as the main dimension of the key competence "Learning to learn", in the spirit of ensuring that autonomy required by the educational ideal.

In Romania, *Law on Pre-University Education* notes by Art.1 (3): "The educational ideal of the Romanian school consists in the free, integral and harmonious development of human individuality, in the formation of the autonomous personality and in assuming a system of values that are necessary for personal fulfillment and development, for the development of entrepreneurship, for active citizen participation in society, for social inclusion and for employment on the labor market." [23, p. 2]

In the Republic of Moldova, the educational ideal is formulated in Art.6 of the *Education Code of the Republic of Moldova*, thus: "The educational ideal of the school in the Republic of Moldova consists in forming the personality with a spirit of initiative, capable of self-development, possessing not only a system of knowledge and skills necessary for employment on the labor market, but also independence of opinion and action, being open for intercultural dialogue in the context of the assumed national and universal values." [6, p.5]

These formulations in terms of educational ideal thus emphasize the need for training that ensures the individual's autonomy, self-development and self-valorization, and these desirable attributes can only be triggered by integrating metacognition into the learner's consciousness. The literature highlights the multitude of advantages that metacognitive

behavior generates. One of these advantages is that it represents "a key element of the control that the individual can exercise over his thinking"[33, p.64] and which implies the existence of "four factors of cognitive self-knowledge in students: knowing when you know, knowing what you know, knowing what you need to know, knowing how to use intervention strategies". [*Ibiden*] Since metacognitive reactions are not aware of students, it is necessary for the teacher to direct formative actions in the direction of connecting the learner to his own cognitive apparatus, so that he learns how to produce conscious and effective learning, assumed by branched, higher-order thinking, capable of multiple connections in the exercise of his functions. The importance of this approach is amplified if we demonstrate that metacognition is formed from the early school period, despite the concrete-intuitive thinking of the primary school student. Moreover, the initiated studies are not bidding for the primary education department, precisely because of the belief that metacognition is assimilated by human behavior, in the stage of logical-rational thinking that materializes somewhere towards upper secondary education or in the academic, university space.

Through the above, the scientific research approach justifies its need to search and identify mechanisms, conditions and principles formulated in terms of metacognitive training, imposing on research so far new directions of theoretical-methodological substantiation.

Description of the research situation and identification research problem.

The notional-semantic spectrum approach of metacognition has been a pole of investigative attraction for researchers worldwide. Regarded as a sum of contradictions, the metacognitive phenomenon has been presented in a diversity of forms and factorial determinations.

In the area of the international scientific community, we notice the contributions of writers such as: Hart T.[44], Flavell J. [42], Quigley A., Muijs D. and Stringer E. [49], Webb J. [53], Koriati A. [45], Papaleontiou – Louca E. [47] who defined and treated metacognitions as a means of evaluating thinking, with real implications in the self-regulating process of processing and managing information internally – cognitively. Since the formation of this factor can only be achieved through didactic communication, through the use of a repertoire of communication strategies well defined conceptually and praxiologically, it is worth mentioning the ideas of some researchers on this segment, such as: Cojocaru - Borozan M. [7], Bârlibaba M. C. [2], Pânișoara I. – O. [31], [32], Lesenciuc A. [24], Șoitu L. [37] who contributed to the communication valorization in the context of skills formation.

By referring to metacognitive components from a reflective perspective, we note the pedagogical discourses of researchers Cornoldi C. [40] and Tarricone P. [52] who taxonomically rendered the entire metacognitive construct.

In Romania, research on the metacognitive phenomenon falls within the sphere of interest of notable authors in the field of pedagogical and psychological sciences. Thus, E. Joița [20], [21], [22], F. Mogonea [27], R. Henter [19], M. Miclea [25], D. Sălăvăstru [33], I. Neacșu [28] offered multiple perspectives to the metacognitive concept, insisting on the need to attribute this factor to the training process. The scientific interpretations generated have contributed to the clarification of certain terminological aspects, while some researches have formulated pedagogical conditions for the management of metacognitive integrators within the formative interior of the classroom.

In the Republic of Moldova, we are witnessing an intensification of searches for metacognitive reality from multiple investigative perspectives. *Thinking about thinking* orients the notes of researchers such as: N. Silistraru [34], [51], V. Panico [30] or V. Andrițchi [1] who direct the pedagogical discourse on the attitudinal component of learning, thus offering the first perspectives of conceptual nuance of deep learning by acceding to metacognitive behavior.

The formation of metacognitive competence in primary school students as a pedagogical research problem relates to:

a) theoretical aspects: the specialized literature does not yet possess the linguistic-semantic property of the term. It remains confusing for a large part of the scientific community, due to the lack of a homogeneous approach that makes existing theories compatible, especially since these perspectives belong to different fields of knowledge.

b) methodological aspects: primary education is placed on a sterile ground, we say, from the perspective of assuming transversal - metacognitive competence. The lack of training programs for primary school teachers focusing on capitalizing on metacognitive competence makes it impossible to transfer this competence to young schoolchildren. *Intellectual energy* is based on the many connections that take place in the human mind. Understanding one's own cognitions is the binder towards the vector functioning of metacognitive integrators, which also includes specific actions of decision management, risk management, mapping and mental scanning with implications in the access to metaknowledge, to the cognitive metalanguage necessary in the lifelong learning process. **Scientific research aims to provide answers to the following questions:** *What is metacognition and what implications does it have on the development of young schoolchildren? How can competence be developed through didactic communication? How should the transfer of metacognition from teacher to primary school student be approached methodologically? What are the variables of the metacognitive training process? What are the indicators, descriptors, variables and values of metacognitive competence?*

From the preparatory analysis of the research field we identified several **contradictions**, thus:

- Although cognitive is the basis of metacognition acquisition, there are no scientifically substantiated pedagogical mechanisms to achieve the cognitive-metacognitive transition within the school context of primary grades.
- Despite the fact that, in the training process in primary education, the main emphasis is on the formation of cognitive competence, teachers succeed to an insufficient extent in opening up the formation of metacognitive competence, as they have not formed this competence.
- Although students can be trained in "*knowledge knowledge*", methodological tools, experimentally validated, to achieve this goal are lacking.

The stated contradictions and the analysis of the literature led us to identify **Research problem:** *What are the theoretical and methodological foundations of metacognitive competence formation in primary school students?*

Object of research: the process of formation of metacognitive competence in young schoolchildren.

The purpose of the research: theoretical and methodological substantiation of the Pedagogical Model for the formation of metacognitive competence in primary school students through didactic communication.

Research objectives:

1. Determination of the theoretical foundations of the concept of metacognition.
2. Identification of communication patterns in the context of ensuring the transfer of metacognitive competence from teacher to young school age student.
3. Elaboration of the Pedagogical Model for the formation of metacognitive competence in primary school students through didactic communication.
4. Development of indicators, descriptors, variables and values of metacognitive competence in the context of designing training approaches.
5. Development and experimental validation of the Metacognitive Competence Training Program addressed to primary school students.

General hypothesis of the research: The formation of metacognitive competence in primary school pupils through didactic communication can be guaranteed if: will be based on the most relevant theoretical benchmarks of metacognition; folding communication models for the formation of metacognitive competence will be capitalized; will be carried out on the basis of the Metacognitive Competence Training Program, as an element of *The pedagogical model of metacognitive competence formation in primary school students through didactic communication*, which will contribute to understanding the mechanisms of functionality of own thinking in primary school students.

Methodology of scientific research. In order to carry out the investigation, the following research methods were applied: *Theoretical method*: scientific documentation; analysis and synthesis; generalization and systematization; induction and deduction; theoretical modelling; *Metode Empirice*: scientific observation; Conversation; survey of pupils; pedagogical experiment; *Statistical methods*: qualitative and quantitative analysis of experimental data, processing and interpretation of the results obtained within the pedagogical experiment.

Scientific novelty and originality of research resides in: semantic perspectives of the key concept - metacognition; conditionalities and relationships between teacher and student in the context of the formation of metacognitive behavior in primary education; system of indicators, descriptors, variables and values of metacognitive competence; the concept of metacognition; the essence of metacognitive competence as an integrated system of attitudes, skills and knowledge; The pedagogical model of formation of metacognitive competence in primary school students through didactic communication.

Scientific problem solved in research consists of: conceptualization and functionality *Pedagogical model of metacognitive competence formation in primary school students through didactic communication* and the Metacognitive Competence Training Programme which contributed to the formation of metacognitive competence of primary school pupils.

Theoretical significance of research consists of: developing the concept of metacognition by identifying the defining features of the subject of learning possessing metacognitions; identification of relational conditionalities of the teacher-student dyad; establishing the particularities and significance of the concept of metacognition in terms of pedagogical and psychological dominants; variables, indicators, descriptors and values of metacognitive competence in the context of primary education; models of didactic communication applicable to the acquisition of metacognitive behavior; the integrative matrix of metacognitive components from a multimodal perspective: motivational, discursive-pedagogical, organic-instrumental; principles of didactic communication and principles of formation of metacognitive competence.

Applicative value of the work consists of: the theoretical – praxiological fundamentals and the corpus of pedagogical tools, integrated in *The pedagogical model of metacognitive competence formation in primary school students through didactic communication*; The metacognitive competence training program that capitalizes on various contexts of didactic communication and streamlines the transfer of metacognitive competence from teacher to student.

Main scientific results submitted for support:

1. Metacognition is a process of reflection oriented towards awareness and control of thought, for which the student becomes responsible and conscious, in order to adapt and adapt to the situation / school, social, existential context. In expressive terms, we note metacognition as the license to run one's own brain (including parameters of variation in cognition awareness, expressed in terms of: knowing vs. not knowing).

2. The metacognitive learner possesses the ability to self-control their own learning environment; ability to self-assess the degree of difficulty of cognitive conflicts; the ability to identify and differentiate the feeling of knowledge from that of not knowing and act critically by regulating one's own learning while performing certain school tasks; the ability to determine emotional problems and the effects of distractions that occur in the learning activity; the ability to self-regulate emotionally, through intrinsic communication and self-analysis of feeling and orchestrating a whole system of metacognitive strategies generating favorable outcomes.

3. The experimental program for the formation of metacognitive competence elaborated / built on the basis of the Model for the formation of metacognitive competence in primary school students through didactic communication is based on the following value components: valences of pedagogical discourse, actions to support student learning, roles of the teacher, attitudes and metacognitive values.

4. Capitalization of theoretical foundations that essentialize the concept of metacognition and communication models that ensure the transfer of metacognitive competence within the instructive-educational process from teacher to primary school student.

5. *Taxonomies specific to metacognitive learning*: (a) for the didactic principles component: *adaptive, actional, reactionary, combinatorial, reflexive, internalized, attitudinal, structural, differentiated, systemic*; (b) for factors influencing competence development: *diagnostic, interactional, situational, comparative, contextual*; (c) metacognitive variables: *internally oriented – cognitive, innovative, collaborative, forward-looking, global*.

Implementation of scientific results: was performed at the Secondary School "Șerban Vodă Cantacuzino", Călimănești and the Secondary School Berislăvești, Vâlcea County, Romania, for the students of the third grade.

Approval and validation of scientific results. The main results of the research are highlighted in the published scientific articles, in the communications held at scientific conferences and in the Reports within the Guidance Commission, the Doctoral School Council.

Publications on the topic of the thesis: 15 scientific papers: 6 articles in scientific journals from the Republic of Moldova and Romania and 9 articles presented at national and international conferences.

The volume and structure of the thesis. The content of the thesis includes: annotation (in Romanian and English), list of tables, list of figures, list of abbreviations, introduction, 3 chapters, general conclusions and recommendations, bibliography consisting of 141 titles, 32 annexes, a total of 148 pages that make up the main body of the research paper.

Keywords: metacognition, constructivism, reflexive teacher, metacognitive student, self-regulated learning, metacognitive competence, metacognitive behavior, metacognition, didactic communication, cognitive conflict, metacognitive mediation, principles of didactic communication, integrative matrix of metacognitive components.

CONTENT OF THE THESIS

In **Introduction** The actuality and importance of the research topic and the description of the situation in the field of research are highlighted. Also, the problem of research that nuances the purpose and objectives necessary for its solution is formulated, the methods applied in the research and the summary of the thesis compartments are noted.

In **Chapter 1 - Conceptual landmarks of didactic communication as premises for the formation of metacognitive competence in primary school students** The main theoretical directions of the concept of metacognition are outlined and analyzed, in the context of didactic communication, conceptual association errors existing in the specialized

literature are identified, metacognition being confused with other processes such as: *cognition, mentalization, or self-regulation*.

At the same time, the investigative approach aims to manifest the metacognitive factor from a psychological and pedagogical perspective and to identify practical, functional examples that allow the initiation of the young schoolchild in knowing his own cognitive system.

Of particular importance in shaping the directions of conceptual elucidation had the theories formulated by researchers such as: Dewey J. [41] who tried to present the way man thinks, insisting on the so-called destructuralization of thought; Hart T. who researching memory lives the "experience of the feeling of knowing" by discovering that, in an attempt to remember, man has the feeling translated by the phrase: "it is on my tongue", thus offering the sensation of knowledge, but also the impossibility of immediate reproduction. [44, p.209]; Flavell J. considered the rightful founder of this concept that defines metacognition as "knowledge about cognitive phenomena" [42, p.906]; Cornoldi C. [40] who studied especially the components of reflexive metacognition and who generated the entire process of critical reflection, oriented by the conceptual framework of metacognition.

Chapter 1 opens up broader perspectives regarding the assumption of the metacognitive factor in the training process. These perspectives are found in identifying conditionalities and relationships that occur between school life entities: the teacher and the student in primary education classes, in building the process of teaching – learning – metacognitive evaluation.

Because Society demands of individuals *to do, to know, interact with themselves and others, find solutions to various problems in various contexts, persevere in lifelong learning*, asks them "**LET IT BE**", educational levers are needed to lead to the fulfillment of this complex desideratum, by assuming the understanding of one's own cognitive system. Thus, we found that the transfer of metacognitive competence from teacher to student can take place through procedures such as: *observation of teacher behavior, thinking out loud, verbalizing the resolution actions to which it joins Motivation for achievement* as the main factor ensuring success in learning and developing *Learning experiences* engaging, challenging, cognitively impactful.

At the same time, based on multiple analyses of the terminology and semantics of the concept of metacognition, we formulated our own definition, as follows: Metacognition *It represents a reflection process oriented towards awareness and control of thought, for which the student becomes responsible and conscious, in order to adapt and adapt to the situation / school, social, existential context. In expressive terms, we note metacognition as the license to run one's own brain (including parameters of variation in cognition awareness, expressed in terms of: knowing vs. not knowing).*

Moreover, we managed to identify in this chapter, the defining features of the metacognitive student who: *manages to control his own learning environment, to assess the degree of difficulty of cognitive conflicts, to identify and differentiate the feeling of knowledge from that of not knowing, to act critically by regulating his own learning while performing certain school tasks, to determine emotional problems and the effects of distractions that occur in learning activity, to be able to self-regulate emotionally, through intrinsic communication and self-analysis of feeling, to orchestrate a whole system of metacognitive strategies generating favorable outcomes.*

A special place is attributed to models of metacognitive practice and to the distinct corpus of methods designed to facilitate the transfer of metacognition to young schoolchildren. Models such as those of Anderson N. J. [38] and Balk F. M. A. [39] have been the benchmark of good practice in achieving metacognitive potential. The functionality components of the presented models take into account, in particular, the regulatory dimension

of metacognition through actions of *Planning, monitoring and evaluation* very well delineated and didactically integrated.

Also, a central role in the ideational exposition in Chapter 1 was played by the essentialization of self-regulated learning in which the metacognitive component is integrated. The reflections formulated by Mih V. [26], Zimmerman B. J. [54], [55], Ruohotie P. [50] and Pintrich P. R. [48] constituted specialized mechanisms for controlling and regulating learning with emphasis on metacognition, motivation and strategy. The approach helped clarify some aspects of conceptual confusion, as metacognition is often confused with self-regulation.

In this note, Mih V. identifies the dimensions of self-regulated learning that we consider to be the prerogative of metacognition development in primary school students and which substantiated the metacognitive formation approach initiated as a result of this research: "*setting specific study objectives; allocating attentional resources to identify information; use of effective strategies for coding, elaboration and organization of information; visualizing or generating mental images or behavioral sequences to be able to retain information; use of effective study resources; self-training; self-monitoring of performance; self-assessment of progress; efficient time management; organization of the learning environment; requesting assistance in case of need; identifying strengths regarding one's own abilities; valuing learning; anticipating outcomes; experiencing feelings of satisfaction according to the effort made.*" [26, p.306-307]

Creating a broader vision of the concept of metacognition from a psycho-pedagogical perspective, by establishing the operationality components and by identifying the relational conditioning of the teacher-student dyad outlined a distinct orientation, offering novelty to research.

In Chapter 2 - The methodology of metacognitive competence formation in primary school students through learning situations in the context of didactic communication, the constructivist alternative is presented as an approach of pedagogical professionalization for metacognitive teaching and learning and capitalized on didactic communication strategies in the context of metacognitive competence formation.

The Praxiological Dictionary of Pedagogy, Volume I, notes constructivism as a "construction of knowledge" that leads to a methodical-practical approach, centered especially on the subject of learning, since it must: "inform, search, critically select information regardless of its source, reformulate, analyze, compare, classify, evaluate, formulate hypotheses, test, experiment, draw conclusions, process data, make generalizations".[3, p.252] These actions instrumented by the subject of learning himself build the praxiological foundation of metacognitive manifestation, establishing at the same time clear directions for what the teacher must initiate at the level of the educational process and outlining a new perspective on the roles assumed by him: reflexive practitioner, metacognitive mediator, facilitator, co-participant in building student knowledge.

We believe that the value principles of constructivist instruction are based, on the one hand, on student-centeredness and on his/her development needs, and on the other hand, building knowledge/understanding through the direct and direct metacognitive action of the student as a reaction to formative activities and investigative approaches assigned through the learning and research process. The last years of research related to learning have led us more and more to the need to transmit to students primarily skills and attitudes that the teacher permanently shapes, ensuring that he does not disclose knowledge, *but guides the student's behavior*, so that he accesses it personally through the transformational empowerment generated as a result of the formative intervention to which he is subjected. This transformational empowerment envisages: the ability to actively construct learning, to reconfigure information, to internalize the actions that build learning, to rethink, using one's

own beliefs, the entire cognitive construct underlying personality formation, and to configure and reconfigure each mental processing.

In our opinion, education means first of all a self-orientation, a cultivation of the self and at the same time a modeling imposed on the self. Therefore, cultivating metacognitive competence is a major desideratum of schools and education practitioners, so that we can access the achievement of the educational ideal defined by educational public policy documents.

For our field of research, it is of interest to enunciate the roles and dimensions of metacognition made by researcher Mogonea F.. She identified the following aspects of the metacognitive process: "influences learning, but in turn is built into/through learning; It is important in the learning process, because it focuses on process, construction, operations, more than products: it aims mainly at "how to learn" rather than "what is learned" / "what has been learned"; allows the formation of investigative behaviors, assimilation of knowledge strategies; facilitate the formation/development of resolution behaviours; allows the development of decision-making behaviors; leads to the formation of investigative behaviors; allows anticipating, predicting, finding and mentally representing solutions, ways of avoiding difficulties, organizing, solving, regulating; allows the subject to analyze the previous experience, in relation to the new task, which he retains, explores or ignores; allows to actively process previous experience, to modify, reconstruct or use it for the new scheme, expanding new knowledge, understanding, interpretation; leads to self-management, respectively to outlining ideas on one's own way of designing, organizing actions, decision-making, managing cognitive resources and strategies, monitoring their application, control and appreciation, regulating cognitive activity; directly influences the motivational structure of learning, motivation for learning and progress; influences the level of expectations." [27, p.24-25]

We also considered it important to present in chapter 2, didactic communication strategies in the formative context of metacognition. We found that teachers are deficient in this methodological segment and that is why we built the discourse, in the direction of adapting existing communication models within the specialized literature and identifying and adapting methods and procedures to the age specifics of young schoolchildren.

By reference to the theoretical and praxiological landmarks substantiated in the current research, the *Pedagogical Model for the formation of metacognitive competence in primary school students through didactic communication* was developed.

The pedagogical model for the formation of metacognitive competence of primary school students through didactic communication (Figure 2.1) represents a form of "didactic transposition" because it envisages an entire mechanism of scientific facilitation, oriented towards the accessibility of educational knowledge, towards which the subject of learning itself is heading. The sustainability of this didactic process of transformation, of processing scientific material, is conditioned by the relationship between teacher and student, a relationship based on the principles and legalities of communication in a pedagogical context.

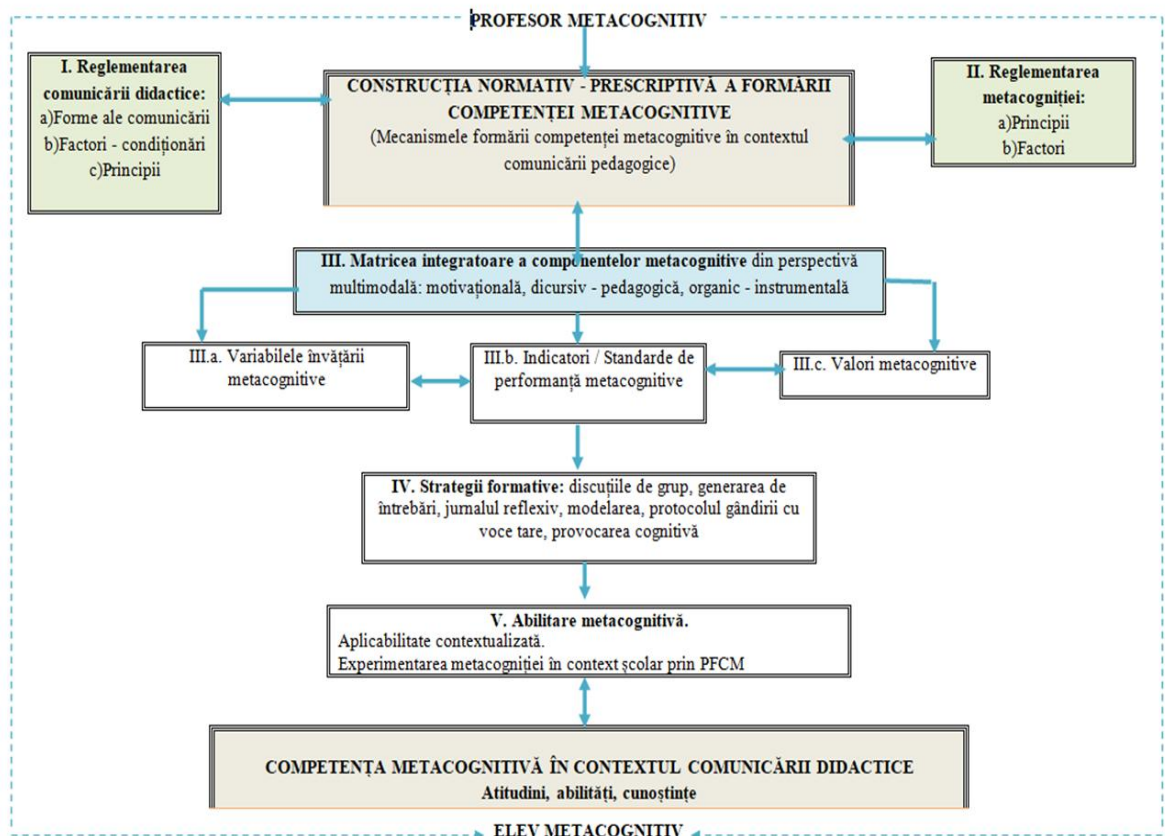


Fig. 2.1. The pedagogical model for the formation of metacognitive competence of primary school students through didactic communication

Multimodal dimensioning of the integrating matrix of metacognitive components on the three axes: *motivational, discursive - pedagogical, organic - instrumental* imposed a reconstruction of the training approach, focused on understanding the learning process and identifying procedures for solving cognitive conflicts at the mental level.

At the same time, *the designed pedagogical model* has as final goal, the formation of the metacognitive behavior of the student in primary school, which involves the internalization of knowledge, empowerment and attitudinal actions corresponding to the metacognitive competence at the structural level. Thus, we present in **Table 2.1** the structure of metacognitive competence in terms of attitudes, abilities and knowledge:

Table 2.1 Metacognitive competence structure

Metacognitive Attitudes	Metacognitive skills	Metacognitive knowledge
<ul style="list-style-type: none"> Motivation and confidence in one's own cognitive system. The belief that obstacles to learning can be overcome. The belief that there is the possibility of improving school performance by appealing to the level of higher thinking, of the "meta" type. The desire to experience more and more varied 	<ul style="list-style-type: none"> The ability to become aware of one's own thoughts and actions. The ability to reflect on metacognitive phenomena by asking clarifying questions. The ability to plan and organize cognitive activities (setting goals and deadlines for achievement, identifying resources, developing concrete action plans aimed at 	<ul style="list-style-type: none"> Knowledge related to the individual learning process. Knowledge of cognitive phenomena. Understanding the mechanisms of effective learning. Knowledge and understanding of one's own limits manifested in the learning activity. Knowledge about strengths and weaknesses identified in

<p>contexts, in order to contribute to the permanent restructuring and refinement of mental schemes.</p> <ul style="list-style-type: none"> • The belief that the effort made in learning will generate the achievement of a maximum performance point at individual level. 	<p>achieving goals).</p> <ul style="list-style-type: none"> • Ability to evaluate performance and adjust behavior towards success. • The ability to regulate emotions to support learning and concentration. 	<p>the process of your own learning.</p> <ul style="list-style-type: none"> • Knowledge of strategies that improve personal/school performance.
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Quality and functionality *Pedagogical model of metacognitive competence formation in primary school students through didactic communication* They are conditioned on the one hand by the state of the parameters defining the theoretical-methodological intervention, and on the other hand by the multitude of factors that can influence the learning reaction of the young schoolboy. Therefore, the process of adapting the training approach in order to obtain self-reflexive abilities involved: formulating didactic principles, identifying effective work strategies, but also respecting methodological conditions and a real inventory of factors that can potentiate or create limits in the manifestation of autonomous behavior in training. More *Pedagogical model* reflects in theoretical and praxiological terms the pedagogical approach of forming metacognitive competence in primary school students.

Chapter 3 - Experimental capitalization of the efficiency of the model and of the metacognitive competence training program from the perspective of didactic communication in curricular context described the pedagogical experiment in its entirety of the constituent stages. The first stage, the finding one, highlighted the need to introduce metacognitive behavior to students at young school age, outlining the prospects for implementing and capitalizing on *Pedagogical model of metacognitive competence formation in primary school students through didactic communication*.

The main objectives of the experimental finding stage were: establishing the educational context for designing the educational process in accordance with assuming the desiderata of metacognitive learning of primary education students and analyzing public policy documents that capitalize on the metacognitive factor at normative and legislative level; Development and application *Metacognitive Behavior Awareness Questionnaire*; Application *Metacognitive Awareness of Reading Strategies Inventory (MARS)* (*adapted from Mokhtari, K., & Reichard, C., 2002*)[46]; assessment of the level of metacognitive awareness of students; identifying problems related to the development of metacognitive behavior for the age segment of small schooling, following the analysis of the results recorded after applying the two questionnaires.

Between 2021 and 2022, the probing of the experimental sample was carried out in the following school units in Vâlcea County, Romania: Secondary School "Șerban Vodă Cantacuzino", Călimănești, Gymnasium School Com. Berislăvești, Gymnasium School Nr. 1 Sălătrucel, Secondary School Sat Dăești, commune Popești, Secondary School Nr. 13, Rm. Vâlcea.

The experimental sample consisted of 103 students arranged as follows: 45 students formed the *Experimental Group* and 58 students formed as *Control Group*.

We summarize the main conclusions formulated after applying the two questionnaires to students from the two experimental groups, in the experimental finding stage: students do not reflect on their personal way of learning, they do not know either the learning process or its functionality; the strategic repertoire of the subjects is limited, they apply more freely a set of rules imposed by the teacher (*Read the requirement several times!*); there is no

interdependence between the factors underlying self-regulated learning through metacognition (personal, behavioural or context factors); Educables are not trained to generate personal meanings that contribute to a better interpretation of the material with which they interact in the school environment; no internal language is used; no goals and objectives are set in learning, and this aspect negatively influences the motivational component of learning; We cannot talk about the existence of a management of learning distractions because we cannot talk about the duality of **purpose - attitude**; there is always an **influence of others** on the trainable, difficulties in generating valid solutions being directed to the teacher, parents, colleagues or other people in his entourage.

In order to highlight the ascertaining results, we will refer to some of them, in order to build a broad image of the researched phenomenon and of the issues identified at the level of didactic design.

So, *Item 1 of the questionnaire "What is learning?"*, involves providing a semantic definition or association to the learning process.

Table 3.1 Results recorded in the finding phase for Item 1 – What is learning?

Sample typology	Number of subjects surveyed	Answers of surveyed subjects according to descriptors			
		<i>Appropriate</i>	<i>Partially adequate</i>	<i>Inappropriate</i>	<i>No response</i>
Experimental	45	11 (24,44%)	12 (26,66%)	22 (48,88%)	0
Control	58	15 (25,86%)	15 (25,86%)	28 (48,27%)	0

From the analysis of the answers provided by the surveyed subjects (Table 3.1), we find that a fairly small percentage of students can attribute an answer to learning *Appropriate* (11, about 24.44% subjects in the Experimental Group and 15 – approx. 25.86% in the Control Group). Response category *Inappropriate* records the highest percentage values (48.88% for subjects in the Experimental Group and 48.27% for subjects in the Control Group).

Regarding *Item 5 - In solving a difficult problem do you use certain schemes or plans to find the solution or give up without trying?*, we tried to capture the degree of reflective analysis of students, the capacity of awareness of their own cognitive system and declarative strategy.

Table 3.2 Results recorded in the finding phase for Item 5 – In solving a difficult problem, use certain schemes or plans to find the solution or give up without trying

Sample typology	Number of subjects surveyed	Answers of surveyed subjects according to descriptors			
		<i>Advanced</i>	<i>Intermediate level</i>	<i>Elementary level</i>	<i>Level of risk</i>
Experimental	45	0	0	43 (95,55%)	2 (4,44%)
Control	58	0	0	58 (100%)	0

The analysis of the answers recorded in Table 3.2 provides information about how much primary school students are aware of the strategy for solving a task, how they act at cognitive level to relieve tension by solving the problem or the exercise offered by the teacher in an educational context. Thus, we note that none of the interviewed students can be included in the *Advanced* or *Intermediate Level*. The largest share is found at the *elementary level* (43 subjects – 95.55% for the Experimental Group and 58 subjects – 100% for the Control Group).

Item 7 - What strategy do you use to solve a difficult task? Ask study participants to reflect on work strategies used during cognitive conflict resolution. Procedural knowledge is an example of clarity and resolution accuracy. Despite the importance of these strategies, it is observed (*see* Table 3.3) how students cannot prove procedural knowledge in materializing the solution of a learning experience, offered in the educational environment, in order to ensure learning for understanding. Thus, the recorded data places the questioned subjects at the *Minimum Level* (10 subjects of the Experimental Group versus 17 students of the Control Group) and at the *Risk Level* (35 subjects – 77.77% – from the Experimental Group *versus* 41 students for the Control Group).

Table 3.3 Findings results for Item 7 – What strategy do you use to solve a difficult task? How do you proceed?

Sample typology	Number of subjects surveyed	Answers of surveyed subjects according to descriptors			
		Advanced	Intermediate level	Minimum	Level of risk
Experimental	45	0	0	10 (22,22%)	35 (77,77%)
Control	58	0	0	17 (29,31%)	41 (70,68%)

In addition to *Metacognitive Behavior Awareness Questionnaire* elaborated by the authors of this study, we applied *Metacognitive Awareness of Reading Strategies Inventory (MARS)* (adapted from Mokhtari, K., & Reichard, C., 2002). Comparative analysis of MARS subscales (See Table 3.4) demonstrates a low level of metacognitive awareness among the surveyed students.

Table 3.4 Means of GE and GOC independent samples in the MARS test at the experimental finding stage

MARS Subscale	Media GE	Average GC	Average difference between GE and GC	GE Level	GC Level
Global	1,72	1,59	0,13	Reduced	Reduced
Problem-solving	1,83	1,68	0,15	Reduced	Reduced
Support	1,84	1,59	0,25	Reduced	Reduced
Total	1,79	1,62	0,17	Reduced	Reduced

The totality of data recorded during the experimental finding phase allowed us to impose as a necessity the formation of metacognitive competence of primary school students, in order to ensure success, progress and school success.

The organization of the training experiment was based on the vision expressed by the national and European public educational policies, assumed by the Ministry of National Education of Romania and the Ministry of Education and Research of the Republic of Moldova, through the subordinated institutions.

The purpose of the formative experiment was to implement and capitalize on the *Pedagogical Model for the formation of metacognitive competence in primary school students through didactic communication* and to develop the *Metacognitive Competence Training Program* dedicated to young schoolchildren.

Main *Objectives* of the formative experiment aimed at: elaboration and implementation *Metacognitive competence training program* in pupils included in the experimental sample.

Period of training activities: Module II, Module III, Module IV of the school year 2022-2023 (October 2022 - April 2023).

Sample: *Metacognitive Competence Training Program* in primary school pupils it included a number of 45 pupils in grades III (20 pupils in grade III B, from *Secondary School "Șerban Vodă Cantacuzino"*, Călimănești and 25 students, from the third grade, from *Secondary School Com. Berislăvești*). They constituted themselves as **Experimental Group (GE)**, out of a total of 103 study participants. **Control Group (GC)** was represented by 58 students from *School Nr.1 Sălătrucele*, *Secondary School Sat Dăești*, *Popești commune* and *Secondary School No.13*, Rm. Valcea.

Metacognitive Competence Training Program It was built dual considering the two entities that stand at the center of the educational system: the teacher and the student, dependent on the one hand on the functionality of pedagogical communication, and on the other hand on the conditions in which learning is carried out. The metacognitive operationalization framework took into account several patterns of process organization: *logical, integrated, branched, strategic* – forms that have led to the construction of a continuous, generative, transformative and well-defined actional system. We present in

Figure 3.1, The schematized structure of the organizational elements of *Metacognitive Competence Training Program* From the perspective of pedagogical communication:

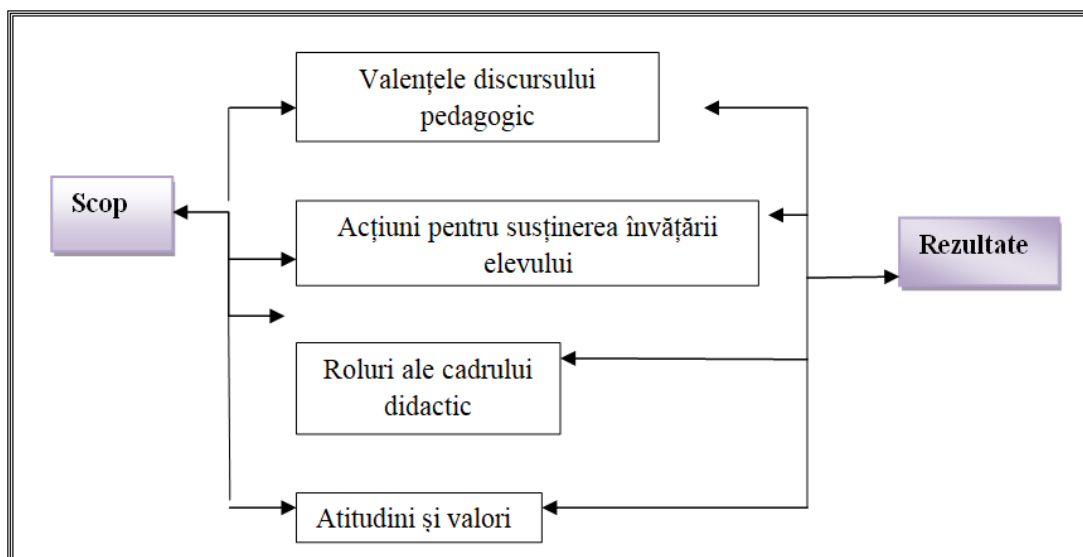


Fig. 3.1 Instrumental-organic components of the *Metacognitive Competence Training Program* in Pedagogical Communication Context

During the seven months of training, the students trained metacognitively demonstrated perseverance, resistance and involvement, thus ensuring the success of the activities carried out within the *Metacognitive competence training program*.

Because *Metacognitive Competence Training Program* also targeted the behavior of the teacher, we outlined the attitudinal picture necessary to build a didactic design in a metacognitive manner (Table 3.5):

Table 3.5 Attitudes promoted through the *Metacognitive Competence Training Program*

Attitudes		
<i>The functionality of the learning process</i>	<i>Metacognition as an expression of cognitive and attitudinal autonomy</i>	<i>Learning oriented towards achieving desirable goals and performance</i>
<ul style="list-style-type: none"> • It generates in terms of educational objectives the scientific material to be assimilated. • Makes analytical correspondences related to the extent to which what was proposed has been achieved. • Methodologically manages the learning activity of students by adapting strategies to the specifics of metacognitive competence formation. • It builds students' self-confidence by accepting errors in learning and defining mistakes as the main means of access to deep understanding. • Find more and more 	<ul style="list-style-type: none"> • Guiding students in setting personal goals. • Building critical thinking by determining scientific truths by questioning their logic and reason. • Allocating formative activity time to students' reflections on past or present performance or to developing plans to improve study actions. • Promoting a permanent exchange of ideas to shape new perspectives of <i>problem solving</i>. • Providing permanent methodological and emotional support to students. • Providing educational alternatives (online educational resources, 	<ul style="list-style-type: none"> • Setting well-defined goals in time. • Organization of the learning process around problematic, controversial situations. • Building <i>descriptive feedback</i> to adjust and improve students' reactions to formative actions and knowledge building. • Simulation of complex and varied educational circumstances to stimulate proactive reactions of students engaged in study. • Personalized approach to learning (differentiated treatment of students, management of distractions). • Design an assessment centred not only on the reproduction of scientific

<p>varied forms to promote and replicate intrapersonal communication to students.</p> <ul style="list-style-type: none"> • It models students' cognitive reactions by proposing more and more mental schemes for the formation of critical thinking. • It promotes an introspectively oriented register of questions. 	<p>technology-assisted learning websites or platforms) that allow learners to target their research by extrapolating their search outside of school.</p>	<p>knowledge and data, but above all on the application of this knowledge system in concrete situations of school or everyday life (competence centred).</p>
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The experimental validation stage had as fundamental *purpose*, the certification of the *Pedagogical Model for the formation of metacognitive competence in primary school students through didactic communication*, as a result of carrying out the formative actions, planned through the *Metacognitive Competence Training Program*.

Objectives of the validation experiment: assessing the level of metacognitive awareness of students subjected to the formative experiment by: *Metacognitive Competence Training Program*; analysis of the structure and functionality of the recorded data; identifying the limits of the experiment performed.

The validation phase took place between May and June 2023, when the experimental sample, consisting of the 103 subjects, was retested. In this context, we applied the questionnaires used at the finding stage, as follows: *Metacognitive Behavior Awareness Questionnaire* and *Metacognitive Awareness of Reading Strategies Inventory (MARS)* (adapted from Mokhtari, K., & Reichard, C., 2002).

Following this approach, we highlight the following results:

At *Item 1 – "What is learning?"* the distribution of the results obtained and presented in Table 3.6, provides a first perspective on the impact generated by the Metacognitive Competence Training Program:

Table 3.6 Numerical and percentage distribution of comparative results recorded by the Experimental Group and Control Group in Item 1 of the administered questionnaire

Item 1: What is learning?								
Sample typology	<i>Performance descriptors</i>							
	<i>Appropriate</i>		<i>Partially adequate</i>		<i>Inappropriate</i>		<i>No response</i>	
	Val.nr.	%	Val.nr.	%	Val.nr.	%	Val.nr.	%
<i>Finding phase (Phase prior to the formative approach)</i>								
<i>Experimental Group (GE-45 elevi)</i>	11	24,44	12	26,66	22	48,88	0	0
<i>Grup Control (GC - 58 ALEV)</i>	15	25,86	15	25,86	28	48,27	0	0
<i>Experimental validation phase (Post-formative interaction phase)</i>								
<i>Experimental Group (GE-45 elevi)</i>	32	71,11	8	17,77	5	11,11	0	0
<i>Grup Control (GC - 58 ALEV)</i>	13	22,41	18	31,03	27	46,55	0	0

Having the complete picture of the data recorded after evaluating the answers provided by the subjects participating in the first item of the administered questionnaire, we can generate the following assessments: *GE* demonstrates that, as a result of the actions to which it has been exposed, it significantly changes its results. Thus, if in the finding stage, *GE* has in the Advanced descriptor category, 11 respondents (24.4%), in the experimental validation stage it reaches the threshold of 32 respondents, with a percentage of 71.1%, thus registering a percentage increase of 46.67% compared to the first measurement. And to the *Partially Advanced* descriptor There are quantitative changes so that, if in the initial phase, prior to training, 12 subjects (26.6%) in the study were evaluated at this indicator, in the post-training phase, the number of respondents decreases to 8 respondents (17.7%), the difference definitely migrating to the *Advanced sector*, where the increase is obvious. The *Inadequate* Descriptor shows significant differences in *GE*: 22 subjects enrolled in the first phase of the criterion analysis (48.8%), compared to only 5 respondents (11.1%) in the last phase of the study, the percentage difference between the two materiality thresholds being 37.7%. Regarding the size of the effect at *GC*, here the differences are insignificant, as follows: for the Advanced descriptor we record the values: 15 (25.86%) and 13 (22.41%); for the *Partially Advanced* descriptor - 15 (25.86%), respectively 18 (31.03%), and for *Inadequate* The shares are 28 respondents (48.27%) and 27 respondents (46.55%). The values obtained as a result of performing the two measurements, lead to the conclusion that the students who make up the *Experimental Group* have formed a clearer idea of learning, understanding in terms of notions the whole process to which they are exposed, compared to *the Control Group* which does not yet have the property of the term "to learn" and which continues to use vague forms of definition, in places, metaphorical.

Table 3.7 Numerical and percentage distribution of GE and GOC comparative results in Item 5 of the administered questionnaire

Item 5: In solving a difficult problem, do you use certain schemes or plans to find the solution, or do you give up without trying?								
Sample typology	<i>Performance descriptors</i>							
	<i>Advanced</i>		<i>Intermediate level</i>		<i>Elementary level</i>		<i>Level of risk</i>	
	Val.nr.	%	Val.nr.	%	Val.nr.	%	Val.nr.	%
<i>Finding phase (Phase prior to the formative approach)</i>								
<i>Experimental Group (GE-45 elevi)</i>	0	0	0	0	43	95,55	2	4,44
<i>Grup Control (GC - 58 ALEV)</i>	0	0	0	0	58	100	0	0
<i>Experimental validation phase (Post-formative interaction phase)</i>								
<i>Experimental Group (GE-45 elevi)</i>	12	26,66	23	51,11	6	13,33	4	8,88
<i>Grup Control (GC - 58 ALEV)</i>	0	0	2	3,44	41	70,68	15	25,86

The data recorded in the *Experimental Validation Phase* changes the numerical and percentage structure for students who have been exposed to training geared towards accessing metacognitions. Thus, the effects of the *Formative Program* are progressing, the *Experimental Group* obtaining: 26.66% (12) for the *Advanced Level* descriptor; 51.11% (23) for the *Intermediate Level* descriptor; at *Elementary Level* we identify a number of 6 respondents (13.33%), and at *Risk Level* We are talking about 4 subjects that represent 8.88%

of the total number of the sample. The fact that we have a total percentage of 77.77% of students who demonstrate that they have metacognitive knowledge, being able to expose / explain them, confirms our expectations related not only to *the Training Program*, but also to the fact that *the Pedagogical Model* we have created is operational, functional and valid from a psycho-pedagogical point of view.

The control group reaches the following thresholds: *Advanced level* - 0; *Intermediate level* - 2 (3.44%); *Elementary level* - 41 (70.68%); *Risk level* - 15 (25.86%). It can be seen from the percentage statistic, how some of those at the Elementary Level value threshold in the finding stage, migrate to *the Risk Level* in the experimental validation stage, while only 2 (3.44%) subjects are placed in the *Intermediate Metacognitive Awareness Level*.

Table 3.8 Numerical and percentage distribution of comparative results recorded by GE and GOC in Item 7 of the administered questionnaire

Item 7: What strategy do you use to solve a difficult task? How do you proceed?									
Sample typology	<i>Performance descriptors</i>								
	<i>Advanced</i>		<i>Intermediate level</i>		<i>Elementary level</i>		<i>Level of risk</i>		
	Val.nr.	%	Val.nr.	%	Val.nr.	%	Val.nr.	%	
Finding phase (Phase prior to the formative approach)									
<i>Experimental Group (GE-45 elevi)</i>	0	0	0	0	10	22,22	35	77,77	
<i>Grup Control (GC - 58 ALEV)</i>	0	0	0	0	17	29,31	41	70,68	
Experimental validation phase (Post-formative interaction phase)									
<i>Experimental Group (GE-45 elevi)</i>	23	51,11	17	37,77	3	6,66	2	4,44	
<i>Grup Control (GC - 58 ALEV)</i>	0	0	0	0	2	3,44	56	96,55	

Item 7 of the questionnaire tested students' procedural knowledge from the perspective of metacognitive competence. The comparative results analysed and captured in **Table 3.8** highlight the impact that the training phase had on the subjects in the experimental sample. They obtained significant differences between tests, and the percentages are distributed as follows: performance descriptor - *Advanced level* - percentage obtained, 51.11% (*GE*) versus 0 (*GC*); performance descriptor - *Intermediate level* - percentage achieved, 37.77% (*GE*) vs. 0 (*GC*); performance descriptor - *Elementary level* - percentage achieved, 6.66% (*GE*) vs. 3.44% (*GC*); Performance descriptor - *Risk level* - percentage obtained 4.44% (*GE*) versus 96.55% (*GC*). For the sample from the **Experimental Group**, the highly metacognitive values (*Advanced Level* and *Intermediate Level*) increased considerably, reaching a cumulative percentage of 88.88%, while the values considered by us, weakly metacognitive (descriptors: *Elementary level*, respectively *Risk level*) changed by significant percentage decrease.

According to the data contained in **Table 3.9** and **Table 3.4** respectively, we can say that the hypothesis initially formulated is experimentally validated and can be generalized.

Table 3.9. Averages of GE and GC independent samples in the MARSJ test

MARSJ Subscale	Media GE	Average GC	Average difference between GE and GC	GE Level	GC Level
Glob	4,26	2,81	1,45	<i>Elevated</i>	<i>Medium</i>
Problem-solving	4,25	2,95	1,30	<i>Elevated</i>	<i>Medium</i>

Support	4,08	2,70	1,38	<i>Elevated</i>	<i>Medium</i>
Total	4,19	2,82	1,37	<i>Elevated</i>	<i>Medium</i>

The awareness of the internal-cognitive processes during reading for the subjects included in the training program led to increased school performance in all subjects studied in primary education, entitling us to declare ourselves optimistic regarding the efficiency of *the Pedagogical Model for the formation of metacognitive competence in primary school students through didactic communication and the Metacognitive Competence Training Program*. However, we also see a rather important evolution in GCs, moving from low to medium level of metacognitive awareness during reading.

Depending on the data provided in the experimental finding and validation stages, we appreciate a significant increase in the level of metacognitive awareness in the students in the experimental sample, compared to those in the control sample. We owe this to the efficiency of the activities within *the Metacognitive Competence Training Program*, which mediated the transfer of metacognitive competence by providing that set of *specific attitudes, skills and knowledge*.

The results recorded in the experimental validation phase confirmed the hypothesis of the research, namely that the formation of metacognitive competence in primary school students through didactic communication contributes to the understanding of the mechanisms of functionality of their own thinking.

GENERAL CONCLUSIONS AND RECOMMENDATIONS

The entire research construct focused on establishing theoretical and applied benchmarks for the formation of metacognitive competence of primary school students. The methodological incoherence in the formation of a metacognitive identity of the young schoolchild and the epistemological opacity of the concept itself create didactic and theoretical confusion, preventing the realization of a productive educational process from the perspective of capitalizing on metaknowledge. The lack of these clear conceptual determinations undoubtedly leads to procedural deficiencies that impact the entire teaching system and process.

The analysis carried out on the investigative process determined us to formulate the following reasoning, deduced from all the arguments and achievements obtained in our research:

1. The study of the specialized literature has outlined unclear and vague perspectives to the concept of metacognition, generating uncertainty at the level of definition and structure of the concept. In this direction, within the research, ***the concept of metacognition was redefined*** as "a reflection process oriented towards awareness and control of thought, for which the student becomes responsible and conscious, in order to adapt and adapt to the situation / school, social, existential context. In expressive terms, we note metacognition as the license to run one's own brain (including the variation parameters of cognition awareness, expressed in terms of: knowing vs. not knowing). The definition was completed by ***identifying the defining features of the subject of learning possessing metacognitions***, as follows: "The metacognitive student manages to control his own learning environment, to assess the degree of difficulty of cognitive conflicts, to identify and differentiate the feeling of knowledge from that of ignorance, to act critically by regulating his own learning while performing certain school tasks, to determine the emotional problems and effects of distractions that occur in the learning activity and to be able to self-regulate emotionally, through intrinsic communication and self-analysis of feeling, to orchestrate a whole system of metacognitive strategies generating favorable outcomes." (Ch.1, 1.1, 1.2)

2. From the perspective of assuming metacognitive behavior both in the teaching process and especially in the learning process, *the relational conditionalities of the teacher-student dyad have been identified*. Also, *the reactions of the research community regarding the evolution of the concept of metacognition action were scientifically interpreted*, which allowed us to outline an inventory of good practices in which the emphasis is on: *learning experiences, thinking aloud, observing the teacher, verbalizing actions in learning, motivation for achievement*. (Chs. 1, 1.1, 1.2., 1.3)

3. In the direction of developing a reflexive, self-determined and autonomous individual, *we have developed and capitalized in the formative context of primary education, the Pedagogical Model for the formation of metacognitive competence in primary school students through didactic communication*. The scientific substantiation of the Pedagogical Model *determined us to elaborate: indicators, performance descriptors, variables and metacognitive values*. (Ch. 2, 2.4)

4. Establishing mechanisms to support the formation of metacognitive competence through the theoretical-scientific action of the *Pedagogical Model for the formation of metacognitive competence in primary school students through didactic communication determined us to elaborate and describe competence through the prism of the integrated system of attitudes, abilities and knowledge*, thus building the finality of the research approach. (Ch.2., 2.4.). At the same time, the systemic components of the pedagogical model *determined the creation of a taxonomy specific to metacognitive learning, as follows*: (a) for the didactic principles component: *adaptive, actional, reactionary, combinatorial, reflexive, internalized, attitudinal, structural, differentiated, systemic*; (b) for factors influencing competence development: *diagnostic, interactional, situational, comparative, contextual*; (c) metacognitive variables: *internally oriented – cognitive, innovative, collaborative, forward-looking, global*.

5. The pedagogical experiment applied to a stratified sample *described in terms of conclusions, the pedagogical model of the formation of metacognitive competence in primary school students*. The identified praxiological minuses outlined the need to form this transversal competence in the conditions of the current educational reform. (Ch.3, 3.1.)

6. *The Metacognitive Competence Training Program (PFCM) was developed and validated experimentally*, having as theoretical support *the Model of metacognitive competence formation in primary school students through didactic communication*. The materiality tables with comparative evaluation of the results recorded by the two experimental groups *demonstrated the effectiveness of the methodological tools developed* within the PFCM. Ch.3, 3.2., 3.3, 3.4)

7. **Scientific problem solved in research** consists of: conceptualization and functionality *Pedagogical model of metacognitive competence formation in primary school students through didactic communication* and the Metacognitive Competence Training Programme which contributed to the formation of metacognitive competence of primary school pupils.

Practical recommendations:

As a result of the conclusions drawn and the results recorded, we identify the following set of recommendations, as follows:

- ***For public policy designers (Ministry of National Education of Romania / Ministry of Education and Research of the Republic of Moldova:***

The significant effects, identified as a result of the investigation, can be a benchmark in the current normative and legislative reconsideration. Rethinking the curriculum for primary education by assuming metacognitive integrators represents a perspective offered by our research, a direction for reforming didactic principles, for reconstructing instructive-

educational actions with emphasis on capitalizing on metathinking of young schoolchildren and performance.

➤ ***For initial and in-service teacher education institutions:***

The models designed and capitalized in an applicative context in the body of the research paper can substantiate analytical training programs, which approved by the Ministry of National Education of Romania or by the Ministry of Education and Research of the Republic of Moldova, can be addressed to teachers, in order to initiate them in teaching - metacognitive learning. Also, steps can be initiated to expand research starting from the recorded results, in order to oversize the effects and to have a broader perspective on the identified phenomena.

➤ ***For educational science researchers***

a) Design of guidelines and curricular auxiliaries that capitalize on the developed methodological resources, highlighting the stages of knowledge building through metacognitive awareness.

b) Continuing the efforts to investigate the metacognitive phenomenon from the multidisciplinary perspective of neuroscience.

➤ ***For pedagogical faculties in Romania and the Republic of Moldova:***

The Departments for Teacher Training in Romania, respectively the Methodical Sections of the Education Directorates of the Republic of Moldova, affiliated to the universities in the field, can integrate these results within the psycho-pedagogical modules, offering students preparing for the teaching career, the opportunity of new actional perspectives, by promoting reflective didactic design, by experimenting with metacognitive teaching, by accessing and understanding their own cognitive and metacognitive activities in the context of increasing academic performance and satisfaction of the teaching profession.

➤ ***For school managers:***

a) Extension of the Metacognitive Competence Training Program exposed in form to more schools, by concluding interinstitutional strategic partnerships.

b) In order to improve the results of students with special educational needs or who manifest difficulties in learning, working groups consisting of teachers (teachers), school counselors, support teachers, psychologists can be set up to adapt the working tools developed during the research work to the specific development of each category of schoolchildren.

➤ ***For primary school teachers/teachers:***

a) Using *the Pedagogical Model for the formation of metacognitive competence of primary school students through didactic communication* in school practice and capitalizing on the methodological resources designed within *the Metacognitive Competence Training Program*, an integral part of this study, to increase students' performance and to amplify the efficiency of the instructive-educational process.

b) Using communication strategies and models presented in research to design teaching activity in accordance with the formation of metacognitive competence in primary school students.

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ANNOTATION
GHEORGHE Elena Cristina

"Formation of metacognitive competence of primary school students through didactic communication"
PhD thesis in educational sciences, Chisinau, 2024

Thesis structure: Annotation (in Romanian and English), list of tables, list of figures, list of abbreviations, introduction, 3 chapters, general conclusions and recommendations, bibliography consisting of 141 titles, 32 annexes, a total of 148 pages that make up the main body of the research work.

Publications on the topic of the thesis: the entire investigative path materialized through the elaboration of 15 scientific papers: 6 articles in scientific journals from the Republic of Moldova and Romania and 9 articles held at national and international conferences.

Keywords: metacognition, constructivism, reflexive teacher, metacognitive student, self-regulated learning, metacognitive competence, metacognitive behavior, metacognition, didactic communication, cognitive conflict, metacognitive mediation, principles of didactic communication, integrative matrix of metacognitive components.

Research: General theory of education.

Purpose of research consists of: theoretical and methodological substantiation of the Pedagogical Model for the formation of metacognitive competence in primary school students through didactic communication.

Research objectives: determining the theoretical foundations of the concept of metacognition; identification of communication models in the context of ensuring the transfer of metacognitive competence from teacher to young school-age student; elaboration of the pedagogical model for the formation of metacognitive competence in primary school pupils through didactic communication; elaboration of indicators, descriptors, variables and values of metacognitive competence in the context of designing training approaches; elaboration and experimental validation of the Metacognitive Competence Training Program addressed to primary school students.

Scientific novelty and originality of research resides in: semantic perspectives of the key concept - metacognition; conditionalities and relationships between teacher and student in the context of the formation of metacognitive behavior in primary education; system of indicators, descriptors, variables and values of metacognitive competence; the concept of metacognition; the essence of metacognitive competence as an integrated system of attitudes, skills and knowledge; The pedagogical model of formation of metacognitive competence in primary school students through didactic communication.

Results obtained that contribute to solving an important scientific problem in research consist of: conceptualization and functionality *Pedagogical model of metacognitive competence formation in primary school students through didactic communication* and the Metacognitive Competence Training Programme which contributed to the formation of metacognitive competence of primary school pupils.

Theoretical significance of research resides in: developing the concept of metacognition by identifying the defining features of the subject of learning possessing metacognitions; identification of relational conditionalities of the teacher-student dyad; establishing the particularities and significance of the concept of metacognition in terms of pedagogical and psychological dominants; variables, indicators, descriptors and values of metacognitive competence in the context of primary education; models of didactic communication applicable to the acquisition of metacognitive behavior; the integrative matrix of metacognitive components from a multimodal perspective: motivational, discursive-pedagogical, organic-instrumental; principles of didactic communication and principles of formation of metacognitive competence.

Applicative value of research consists of: the theoretical – praxiological fundamentals and the corpus of pedagogical tools, integrated in *The pedagogical model of metacognitive competence formation in primary school students through didactic communication*; The metacognitive competence training program that capitalizes on various contexts of didactic communication and streamlines the transfer of metacognitive competence from teacher to student.

Implementation of scientific results it was realized at the Secondary School "Șerban Vodă Cantacuzino", Călimănești and the Secondary School Berislăvești, Vâlcea County, Romania, for the students of the third grade.

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GHEORGHE Elena Cristina

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Scientific novelty and originality of research It resides in: determining the semantic perspectives of the key concept - metacognition; establishing conditionalities and relationships between teacher and student in the context of the formation of metacognitive behavior in primary education; development of indicators, descriptors, variables and values of metacognitive competence; redefining the concept of metacognition in terms of this study; elaboration of the pedagogical model for the formation of metacognitive competence in primary school pupils through didactic communication; description of metacognitive competence as an integrated system of attitudes, skills and knowledge.

Results obtained that contribute to solving an important scientific problem in research consist of: conceptualization and functionality *Pedagogical model of metacognitive competence formation in primary school students through didactic communication* and the Metacognitive Competence Training Programme which contributed to the formation of metacognitive competence of primary school pupils.

Theoretical significance of research resides in: developing the concept of metacognition by identifying the defining features of the subject of learning possessing metacognitions; identification of relational conditionalities of the teacher-student dyad; establishing the particularities and significance of the concept of metacognition in terms of pedagogical and psychological dominants; identification of the scientific perspectives that marked the evolution of the term; development of variables, indicators, descriptors and values of metacognitive competence in the context of primary education (in terms of process, product, meaning, personal, systemic); elaboration of didactic communication models applicable to the acquisition of metacognitive behavior; creation of new knowledge about metacognition (redefining the concept of metacognition); elaboration of the integrative matrix of metacognitive components from a multimodal perspective: motivational, discursive-pedagogical, organic-instrumental; elaboration of principles of didactic communication and principles of formation of metacognitive competence.

Applicative value of research consists of: elaboration and validation of theoretical – praxiological foundations and of the corpus of pedagogical tools, integrated *Pedagogical model of metacognitive competence formation in primary school students through didactic communication*; The metacognitive competence training program that capitalizes on various contexts of didactic communication and streamlines the transfer of metacognitive competence from teacher to student.

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GHEORGHE ELENA CRISTINA

**FORMATION OF METACOGNITIVE COMPETENCE IN PRIMARY SCHOOL
STUDENTS THROUGH DIDACTIC COMMUNICATION**

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