

# Diagnosis of teacher's professional thinking as an orienting activity. Contributions of the P. Ya. Galperin's theoretical system<sup>1</sup>

Diagnóstico do pensamento profissional docente como atividade orientadora. Contribuições do sistema teórico de P. Ya. Galperin

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## ABSTRACT

In this article, a formative experience is presented and grounded for diagnosing a Teacher's Professional Thinking (PPD, in Portuguese) under the conception of thinking as a cognitive activity of the teacher's personality and the method of its study by P. Ya. Galperin. The meaning of the construct of teacher's professional thinking, the object of the diagnosis, is discussed based on its essence, structure and functions. The text also approaches the methodology of the formative experience, elaborated and experimentally tested, which allows the diagnosis above under certain conditions that restrict possibilities and limitations of the formative experience. The results point to a theoretical-methodological contribution to studies on PPD as part of teachers' training and professional development.

**Keywords:** Formative experience; Diagnosis; Teacher's Professional Thinking;

## RESUMO

Neste artigo, apresenta-se e fundamenta-se uma experiência formativa para o diagnóstico do Pensamento Profissional Docente (PPD) sob a concepção do pensamento como atividade cognoscitiva da personalidade do professor e o método de seu estudo, de P. Ya. Galperin. Discute-se o significado do construto pensamento profissional docente, objeto do diagnóstico, na base de sua essência, sua estrutura e suas funções. O texto também trata da metodologia da experiência formativa, elaborada e testada experimentalmente, que permite o referido diagnóstico sob determinadas condições que demarcam possibilidades e limitações da experiência formativa. Os resultados apontam para uma contribuição teórico-metodológica aos estudos sobre o PPD como parte da formação e do desenvolvimento profissional de professores.

**Palavras-chave:** Experiência formativa; Diagnóstico; Pensamento Profissional Docente;

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## 1 Introduction

The diagnosis and characterization of teacher's professional thinking (PPD, in Portuguese) constitute a relevant problem in the area of Psychology and Higher Education Pedagogy. According to Veretennikova et al. (2022), these studies have shown several dimensions of the problem of evaluating thinking in the context of professional activity. Among these studies, the authors highlight: a) weaknesses in the theoretical foundation in the criteria to be considered when evaluating thinking, which affects the reliability of the process; b) lack of knowledge of the potential and epistemological and psychological foundations of different diagnostic methods; c) the spontaneous and improvised nature of the assessment.

Despite the significant growth of research on the diagnosis of PPD in several countries, under the assumptions of the Cultural-Historical School, several authors such as Gilmanshina and Vilkev (2002), Veretennikova et al. (2022) and Núñez & Bandeira (2024), highlight the need to expand the studies of these diagnoses, due to the complexity and theoretical and methodological limitations of several studies related to the nature of PPD.

The situations previously exposed highlight a contradiction between the importance of research about diagnosing teacher's professional thinking and several studies carried out in this regard, which demands new perspectives to improve the processes of characterizing PPD. This contradiction motivated the studies through a formative experience of diagnosing PPD from the perspective of the P. Ya. Galperin School's, which is presented and substantiated in this article.

The text is organized into three cohesive parts to demonstrate a comprehensive whole: a) the meaning of thought as an orienting activity in Galperin's school and its method of study; b) the meaning of PPD as a teacher's orienting activity; c) the diagnosis of PPD in the formative experience.

The discussions express the results of studies by Núñez (2017; 2018), Núñez & Ramalho (2019a; 2019b; 2020a) and Núñez & Bandeira (2024) on the diagnosis of teacher's thinking in Galperin's school carried out over several years in the

Research Group “Study of Thought in P. Ya. Galperin's School”, from UFRN.

In discussions about the problem linked to the diagnosis of PPD, in the text, the dialectic between the historical and the logical must be considered, important categories that reflect the process of temporal and logical development of the object of study to reach its current level. The history allows to understand the movement of the diagnostic problem in the diversity of its forms and its dynamics at different moments in Cultural-Historical Psychology School and in teacher training, which has been determined by the internal dialectical contradictions, inherent to the object of study.

On the other hand, the logical, as a reflection of history, determines the connections, relationships, determinations, and regularities of each of the different qualitative stages which, in turn, allow us to characterize the diagnosis of PPD as an object of study, in the dialectics of its development. This dialectic can be seen in studies on the diagnosis of thinking, such as that by Solovieva (2022), and those on the diagnosis of PPD by Gilmanshina (2008).

## **2 Professional thinking as an object of diagnosis**

Studies on PPD and its diagnosis demand the definition of the theoretical construct of thought as the object of this process. For this purpose and based on certain theoretical assumptions, in the formative experience for the diagnosis, a conceptualization of this type of thinking was created, articulating Galperin's (2023) understanding of thinking as an orienting activity of the personality and its method of study.

### **2.1 Thinking as a personality-orienting activity. Contributions of the P. Ya. Galperin's theoretical system**

P. Ya. Galperin and his school developed a theoretical system and method for the study of conceptual thought. In them, thinking (referring to dialectical verbal logical thinking) is a type of cognitive activity of the personality that, together with others, such as sensorial perception, imagination, and memory, has

an essential role in the teacher's knowledge of the professional world, which is related to their practical and intellectual actions (Galperin, 2023).

Galperin (1967) distinguishes three parts in each objective action of the subject: the orientation (orienting basis of the action), the executing and the controlling. The subject's action is characterized by a complex relationship between these functional parts, and the characterization of the action through execution alone is insufficient. From this distinction, others arise in the understanding of thought, its formation, stages and mechanisms of its development and its diagnosis.

Thinking is an intentional activity (system of actions), it has its objectives, being a process of planning, execution, and regulation under an orientation (orienting basis) prepared by the subject in a given problem situation. This activity is articulated in a set of operations and concepts with the support of material and psychological tools that make it possible to reach the unknown from the known, and whose products, on the micro level, are new knowledge about the object of study and, on the macro level, a new worldview. We emphasize that, under the theoretical approach we discussed, problem situations are contradictory in nature, which is linked, in turn, to the subject's dialectical thinking (Majmutov, 2016; Matyushkin, 2009).

Conceptual thinking, in Galperin's theoretical system, is associated with the main function of the human psyche as an orienting activity of the subject, when it must resolve certain problem situations for which it does not have pre-determined answers. In the process of formulating and resolving the problem situation, the subject needs to consciously create an image as a psychic reflection that allows him to orient himself. This process, Galperin (2023) called the subject's "orienting activity". In the opinion of Galperin (1989), orientation articulates the image of the action with that of the environment in which it takes place, in a single structural element, which makes it possible to plan, execute and regulate the action in which known concepts understood are included and others are elaborate to solve the problem situations. From this perspective, the problem

situation, in the sense of Majmutov's theory (2016), denotes an imprecise situation, of a dialectical, contradictory nature.

Among the main functions of action orientation as a human psychic process, Galperin (1979) highlights: a) building an image of the initial problem situation to act; b) discover the main meaning of the individual components of this situation for the real interests of the acting subject; c) prepare a future action plan; d) orientation of the action during its execution. The orientation of the action towards solving the problem, as an orienting image, allows planning, monitoring, and regulating the execution of the action, according to a certain mental model, also enabling the necessary corrections based on this image. Execution allows transformations of the object of action (ideal or material) by the subject, according to the orientation, carrying out the necessary operations with the concepts (system of concepts) articulated to them. In turn, control is aimed at monitoring the action, by comparing the partial and final results with the action model defined in the orientation, with the aim of making the necessary corrections.

The action as a whole has interdependent functional components, with orientation determining the quality of carrying out the action and its control. This, in turn, enables the improvement of orientation and execution in the process. In Galperin's (1966a) understanding, the essence of thinking lies in the fact that it is an activity of orientation. It includes the conditions of behavior in objective reality, which, in turn, directs human activity in accordance with these conditions. Therefore, in the diagnosis discussed, thinking is understood as an orienting activity of the subject, based on a given orienting image (orienting basis of action – OBA) aimed at solving problem situations, according to Núñez, Pereira and Barros (2024).

By developing a theoretical system that allowed the study of professional thinking as an orienting activity of the teacher and its diagnosis, Galperin established a set of psychological conditions necessary for its formation as a regulated process (which he called controlled) (Galperin, 1989), which constitute interdependent and necessary subsystems, which are:

- 1) the subsystem of an (adequate) motivation for the formation of a new mental action (thought);
- 2) the subsystem of the correct performance of a new mental action. A set of conditions sufficiently complete to guarantee the solution of problem situations is determined by the “framework of complete action orientation” that the subject prepares when faced with certain problem situations, in which the psyche is necessary. Galperin (1979) identified three types of “motivational bases of action” (external, personal and internal) and outlined the forms of their organization;
- 3) the subsystem of desired properties (parameters) of the action (of its orientation), which explains the quality of the orientation (especially of thought);
- 4) the subsystem of staged formation of orientation (thinking). Initially thought with external support, materialized, from its desired operational scheme, to socially communicated thought and, finally, to “pure” thought, without any external support. The steps described reveal a new content of the concept of internalization introduced by Vygotsky, in the context of the genetic approach, for the study of conceptual thinking.

These subsystems are related to a method for the experimental study of the systemic formation of conceptual thinking, according to certain stages, referring to the formation of the new desired orientation (thought) (Galperin, 1966a).

Studies on the formation of concepts and, consequently, conceptual thinking allowed Galperin (2017) to identify three types of orientation or orienting basis of the subject's action, which were characterized according to the method used by the subject to elaborate it, the level of generalization (extent and limits of application) and the detailed nature of its content. Among these types, Galperin (2017) highlights type III, which is complete, but is constructed by the subjects, who follow the approach offered by the researcher, and organized according to the essential characteristics of the learning object concept and the orientation of the general action. With the third type of orientation (complete but being constructed by the subjects after

an analysis method elaborated with the trainer), learning happens quickly, with minimal errors, and the actions formed in the course of this general mental action are transferable to a large number of new situations.

Galperin (1989; 2023) related the types of orientation of the subject with the effect on their psychological development. He studied deeply and showed the effects of good learning on development, something stated (only on a declarative level) in Vygotsky's Cultural-Historical Theory. Regarding the types of orientation, Galperin (2017) and his school showed, theoretically and experimentally, that it is type III orientation that enhances the psychological development of teachers in the Zone of Proximal Development – (ZPD) –, in the context of school learning.

In the formation of the general action related to the desired thinking in teachers, the researcher must create a complete orienting base of reference, must represent, and materialize it, according to what Galperin (1992b) calls the Scheme of the Complete Orienting Basis of Action (SCOBA). This acts in the diagnostic process as the reference model of thought.

While the OBA is the subject's real orientation (subjective), the SCOBA is the basis of orientation desired and structured by the trainer, as one of the essential conditions for the adequate execution of the action and control. These types of schemes are guidelines for both teachers and trainers in relation to objectives. It is an external scheme that helps to reconfigure each teacher's thinking, to become a tool for reflection in this process. SCOBA, similarly to OBA, in the case of an action, is structured based on two models: that of the object (what the action is) and that of the action (the structure of operations of the action). This idea is based on the conception of the inseparable union between concept and action, which allows a better understanding of the action.

SCOBA was named by Galperin (2023) as a generalized operational scheme of thought. According to Núñez, Pereira & Barros (2024), in SCOBA, the thought model represents the rational and invariant structure of the action operations system, what we call Operational Invariant (OI) or thought

model. It is necessary to know OI to characterize its domain according to the levels of its systematization.

In the Galperin's theoretical system and his school, thinking as a cognitive activity of the personality refers to a given process for solving problem situations, in which a new orienting image is necessary to consciously evaluate the situation, seek possible solutions, plan, model, represent the process, execute actions with the concepts and/or develop new ones, regulate and value the solution process, all in such a way as to satisfy certain motives that mobilize the teacher's personality.

As it is a cognitive activity of the personality, it is necessary to emphasize that the cognitive dimension does not exist apart from the affective dimension, which induces personality, that is, motives, needs, desires, since personality is a complex, dynamic whole. As Vygotsky (2009) rightly pointed out, a thought is not born from another thought, but from needs, desires, and affections that the subject experiences in certain situations in life.

## **2.2 Galperin's method for studying conceptual thinking**

According to Obukhova (2010), Galperin created an original approach within the scope of general psychology, proposed an understanding of the object of psychology (mental processes as orienting activity) and developed a new research method based on the formation of a mental phenomenon according to certain indicators of predetermined quality. The staged formation method of conceptual thinking is the method of psychological research aimed at studying the formation of an objective action with certain properties, which was developed by Galperin and is widely used in research within the scope of the study of thinking.

The method originates from Vygotsky's experimental genetic research strategy and constitutes a staged formation of the mental process in question (Galperin, 1966a; 1992a; 1999; 2017). Galperin points out that the name “stage-by-stage formation” was proposed by D. B. Elkonin for the most notable aspect of the method and does not reflect its entire content. The point is not only in the



stages, but also in a complete system of psychological conditions that allow determining the course and result of the formation in a controlled way of new qualities of thinking (Galperin, 1966b). Therefore, it is more correct to speak of a systematic formation system, and not just formation in stages.

According to Galperin (1966b), there is only one possibility of studying the controlled formation of new mental actions: from the outside to the inside, from the external, accessible to control in all its aspects, to the internal, under certain conditions that ensure the formation of the action mental with the intended properties. It is true that “from the outside in” involves considering the subject's cognitive resources to resolve the new situation, characterizing, and modeling these resources as thought, materializing the model, confronting it with new possibilities and creating an appropriate orienting basis that helps to resolve the situations like this. In this way, psychological conditions are created for the formation of this orientation of the subject as thought without any type of support or external help, which is part of the logic of the method of studying thought.

Galperin characterized the method as “a method of detailed formation and open observation of new specific mental processes and phenomena” (Galperin, 1966b). The structure of the orienting activity is not available to external observation, as Galperin (1999) says, it is not a phenomenon, but an essence of psychological mechanisms of action. To study this essence, the mental phenomenon must be constructed, formed. In the mental process, the mechanisms that explain it remain hidden and, therefore, “the only way to discover a new mechanism of new psychological processes is to trace their formation, and necessarily with predetermined properties” (Galperin, 2023). In this way, the method integrates the four subsystems of his theoretical system: a) motivation for the development of new learning; b) determination of the type of thinking (orientation); c) determination of the desired quality of thought; d) formation of new thinking in stages, in a controlled manner (depending on the set of psychological conditions).

With systemic staged formation, a complete system of psychological conditions ensures the correct execution of a new action and its formation with the specified properties. As a result, the process progresses so quickly that in terms of time it is impossible to compare it with a spontaneous process, and the result is largely transferred to new tasks (Galperin, 1989).

The psychological conditions created can explain why the formed action does or does not have the intended properties. Therefore, for Galperin (2023), the lack of desired properties in a mental action, as a result of its formation, is not explained by the subject's cognitive limitations, but by the fact that the conditions for the assimilation of certain means have not been created of mental activity (Galperin, 1999). The method allows an objective and systemic study of mental processes in stages: “[...] we begin with a form of materialized representation of the desired thought (modeled in SCOPA) and, after the formation of the action orientation towards the form of communicated thought, we can safely form thought on the totally mental plane” (Galperin, 2023, p. 231).

### **3 Teacher’s professional thinking as a personality-orienting activity**

#### **3.1 Teacher’s professional thinking**

Studies of teacher’s professional thinking and its diagnosis address the nature and characteristics of thinking as a more general category and have been carried out by several authors, among which we highlight Kashapov (2000), Markova (1993), Vozniak (2019), Nechaev (2015), Gilmanshina (2008), Petrovsky (1989), Núñez & Bandeira (2024) and Núñez & Ramalho (2019a; 2019b). These authors consider the cognitive processes associated with understanding and solving problem situations of teachers in the context of their professional practice. In this approach, it is assumed that the teacher is a professional and teaching is a profession (Ramalho; Núñez; Gauthier, 2004). We use the term teaching in the developmental sense, that is, that aimed at developing the student's personality (Núñez, 2017).

Professional teaching activity is a type of human activity aimed at forming the student's personality, which requires from the teacher a type of orienting activity (orienting image) related to a growing vision of the profession in which contradictory problems are thought about and resolved complexes of a pedagogical nature. As an activity, it presents a structure: object, subject, motive, orientation, means of activity, conditions, product (Leontiev, 2021).

The PPD is always linked to the professional pedagogical activity of teachers. In Galperin's system, this pedagogical activity (action) is structured into three functional dimensions: orientation based on an orienting image as a form of thought (result of an orienting research activity); execution, carrying out the action (or system thereof) and operations to transform the object of the activity; and the control, regulation, of the process and valuation of the result. It is precisely in this direction that, in this type of activity, orientation – orienting activity – corresponds to PPD in the sense of its psychological function in resolving problem situations of professional activity.

PPD is linked to the resolution of problem situations in professional activity that require the teacher to develop a given orientation (OBA) that allows him to evaluate the problem situation, formulate the problem, plan possible solution strategies, model and elaborate conceptual content, solve (address) the problem, as well as value, regulate the process in the creative solution of the situation. This places the problem situation category of professional activity as essential in PPD studies. Therefore, PPD, by its nature, is not only theoretical-scientific, but also reflective, conscious, regulated, creative and dialectical.

From the perspective discussed in the formative experience, the teacher's professional knowledge does not exist apart from specific general intellectual actions inherent to professional activity that allow the solution of problem situations based on broad cultural and professional training aimed at development and increasing professional and personal self-realization. This is situational thinking, influenced by the specific conditions of

professional activity and the needs and motivations of teachers in the face of dialectical, contradictory situations that they must resolve. Therefore, the teacher's professional knowledge cannot be understood separately from professional actions.

Furthermore, PPD develops as a result of formulating and solving problems of professional teaching activity, based on professional activity with problem situations of a dialectical nature (Majmutov, 2016). Thus, this thinking is also linked to the various dialectical contradictions inherent to professional activity, as Gonzalez et al. (2002) and Ortiz (2015) have discussed. This consideration emphasizes the philosophical assumptions of dialectical and historical materialism (Kopnin, 1966; Ilienkov, 2007; Ortiz, 2015) under which PPD is understood in this study. In this sense, PPD assumes to be a pedagogical activity of a dialectical nature, in which dialectical contradictions are sources of teacher's professional development.

As a type of thought, PPD presents a set of characteristics that are necessary for the organization of the processes of its formation and diagnosis, among which we emphasize the characters: reflective, conscious, regulated (self-regulated); scientific-logical; intuitive-creative; systemic. These qualities, among others, as Núñez, Pereira & Barros (2024) warn, are always in one way or another in the thinking necessary to solve professional problem situations. For Galperin (2023), there are not several thoughts, but thoughts with different qualities, which manifest themselves to a greater or lesser extent depending on the demands that professional activities place about the activity. It is important to emphasize that these are some of the characteristics that do not limit others, new or related to them.

In general, PPD as a theoretical construct elaborated in this study and object of diagnosis, presents: a) an essence – it is the orienting psychic activity of the teacher as a professional; b) certain characteristics – it is theoretical-scientific, dialectical, reflective, conscious, critical, creative, among others; c) a function – creatively facing and resolving problem situations in the professional activity of developmental education with a positive effect on their professional

development; d) a structure – orienting image in which the images of the system of theoretical concepts, the system of actions and operations, the solution context and motivation are integrated.

### **3.2 Types of teacher's professional thinking**

There is, in general, a certain consensus in the literature that discusses PPD from an activity approach, in relation to its systemic character and the types of thinking that can be considered associated with it. In the scientific literature that discusses PPD, it is grouped according to three categories that are associated with teacher's types of thinking, necessary for their professional activity, namely: Disciplinary scientific thinking; Methodological (didactic) thinking; Pedagogical thinking (Gilmanshina, 2008).

When understanding PPD as a system, it appears that each of its types exists related to each other, which gives it a holistic, complex, and dynamic character. Gilmanshina (2008) argues that the essence of a teacher's professional thinking manifests itself in the synergistic and dialectical effect of the unity of scientific thinking (disciplinary, to be taught), pedagogical thinking (scientific and applied) and methodological thinking (referring to the teaching the content of the subject).

#### **3.2.1 Pedagogical Thinking**

Pedagogical thinking can be defined by the teacher's set of cognitive processes that aim to solve professional problems of pedagogical management of human development. These are infinitely diverse and characterized by the specificity of the teacher's experiences in different educational contexts, professional development, as well as motivations, interests, and conditions for exercising the profession, among others (Gilmashina, 2008; Kashapov, 2009).

When associating pedagogical thinking with the object of study of Pedagogy, it is necessary to explain an understanding of Pedagogical thinking, given the diversity of its understanding. In the formative diagnostic experience discussed, the pedagogical process is assumed to be the fundamental category of

pedagogy as a science of education. Thus, based on Gonzalez et al. (2002), it is defined as the process determined by the dialectical unity between teaching and education, organized as a whole and aimed at the formation of personality, according to social objectives and which takes place both in school and outside it.

Pedagogical thinking is an activity of understanding, of teacher orientation aimed at solving problem situations of a pedagogical nature, an active process of reflection on professional teaching practice in the form of concepts, judgments, reasoning. This thinking provides the teacher with a general understanding of the essence of the educational process, the objectives of pedagogical activity, the ways and means of achieving them, a specific understanding of students as subjects of education.

It is a thought that goes beyond teaching methodologies and encompasses a broader vision: that of educating the student's personality. Its content is associated with the object of study of Pedagogy as a structuring discipline of teacher professional training, which allows critical reflection and creative teaching practice, based on educational theories. This position reveals the interdisciplinary character of pedagogical thought, as a disciplinary area of Pedagogy to which diverse knowledge and general intellectual actions, attitudes and values that develop in various disciplines such as sociology, psychology, philosophy, history, etc. converge, related to education.

The diagnosis of pedagogical thinking demands the definition of general actions as aspects of its composition and structure that are necessary for its diagnosis according to Galperin's (2023) method of studying thought. These actions are general, but have a functionality given by teaching activity, in general and specific contexts, and allow modeling operational schemes of thinking in reference to this type of teaching thinking.

### **3.2.2 Scientific Thinking**

Disciplinary scientific thinking refers to the thinking necessary for the set of knowledge and general research methods in the discipline that is taught and is related to issues of the epistemology of this knowledge. In other words,

the teacher must think scientifically with the concepts of the discipline he teaches, based on research actions and according to the epistemological nature of these concepts, which presupposes having deep knowledge and general culture related to the discipline he teaches. As Gilmashina (2000) states, this is an essential condition for any creative teaching practice by the teacher.

Disciplinary thinking is characterized by its scientific character (as opposed to common sense thinking) linked to the school's function of contributing to scientific education (of students in the school context). In this text, not only those in the area of natural sciences are considered as scientific subjects, but all of them in the school curriculum. This thinking, in any school subject, is based on scientific concepts, forms and methods of science, disciplines and logic (formal and dialectical).

In the activity approach, the scientific thinking of a subject teacher also requires a deep knowledge of logic (often disregarded) as a content of the teacher's general culture. As part of scientific thinking, there is recognition of the role of logical thinking (formal and dialectical) that allows operating and producing with concepts, judgments and reasoning as forms of thought in learning and in scientific activity itself (production, application of the foundations of scientific knowledge ) (Gilmanshina; Motorygina, 2013; Núñez; Bandeira, 2024), considering the fact that each discipline favors not only general types of thoughts, but also those specific to the discipline.

In Galperin's (2023) theoretical system, logical-verbal thinking with scientific concepts is carried out based on logical (mental) operations that allow the elaboration of new concepts and relationships (reasonings, judgments). According to Núñez (2018), logical culture manifests itself in logical thinking, that is, in the possibility of correctly using the regularities (laws), methods and forms of formal and dialectical logic to reason logically, define concepts, make judgments and conclusions, make inferences, classify, analyze and synthesize, generalize, compare models, etc., as a component of logical actions of logical-discursive thinking, all linked to the methods of science and pedagogical thinking.

Disciplinary scientific thinking results from the special combination of diverse research methods, special dialectical logic in research activity and the critical and conscious solution of scientific problems of the discipline that are part of school content that has a potential for development not only the personality of the students, as well as that of the teacher himself. It is also the synthesis of logical thinking and imagination, which lead to creative thinking. In this way, the inseparable relationship between logical and creative thinking is reiterated. An adequate development of disciplinary scientific thinking presupposes the correct, precise use of the scientific language of the corresponding area, which is linked to the logic of the science taught and the logic of critical thinking.

The diagnosis of scientific thought also demands the characterization of general actions of the discipline that is taught for its necessary instrumentalization for the diagnosis. These actions are not static, they respond to the peculiarities of scientific disciplines and the objectives of education in the school context.

### **3.2.3 Methodological Thinking**

If pedagogical thinking has a more comprehensive character associated with student education, that is, it goes beyond the context of the classroom, methodological thinking is, in a way, more specific and integrated with pedagogical thinking, as stated by Addine (2002). Methodological thinking under the assumptions of the diagnostic experience, connects to the object of study of Developmental Didactics integrated with Pedagogy. It involves the teaching and learning processes of cultural content according to the objectives established in the school's disciplinary programs and pedagogical project. In Núñez's (2017) understanding, this is a thought directly related to the resolution of professional problem situations of practical developmental teaching activities in the classroom, articulated in a dialectical way to the role of education at school.

Developmental teaching presupposes a new form of methodological thinking on the part of the teacher, in the sense of thinking about the student's



learning activity in a new didactic management guided by new motives, objectives, means, methods, evaluation, with a positive effect on the development of the students' personality.

Under Developmental Didactics, methodological thinking as a teacher's orienting activity must allow solving problem situations and making decisions related to: teaching objectives and content; teaching methodologies; teaching resources; assessment; control and regulation of learning; process organization dynamics; attending to the diversity of student groups; creating and maintaining motivation for learning; among others. It must allow the teacher to relate epistemological content (the nature of the content that is taught), the psychology of learning (how we learn, the difficulties in learning, the experiences and motivations of students, communicative interactions and the mediatization of processes, among others), those of sociology (social contexts). As in previous cases, the instrumentation of general intellectual actions related to the objective of the diagnosis must be carried out.

The teacher's methodological and pedagogical thoughts must be understood, in their complex dialectical relationships, as a dialectical unity articulated, in turn, to the subject being taught.

According to what has been presented, the three types of thinking are part of a whole, which is why the diagnosis of one or the other is always linked to the others.

#### **4 Formative experience and the diagnosis of the level of development of teacher's professional thinking**

One of the objectives of this article is to present a PPD diagnostic model developed by Núñez (2018), Núñez & Ramalho (2019a; 2019b) and Núñez & Bandeira (2024), called "Formative experience for the diagnosis of PPD". These studies, based on the assumptions discussed previously, allowed the elaboration and validation of a diagnostic tool to characterize PPD considering the complexity and difficulties of this process, with the possibility of being applied in situations, namely: as an initial diagnosis of PPD dimensions, the processes its formation

and development; and as a final diagnosis, in order to evaluate results in certain formative processes.

In the formative experience, diagnosis is understood as a process of a complex, dynamic and multifactorial instrumental nature that allows obtaining information about the teacher's PPD to formulate and resolve certain professional problem situations based on an orientation (image) resulting from an orienting activity (Núñez; Ramalho, 2019b).

Under the assumptions defined in this study, and considering the nature and structure of the PPD, the diagnosis of its development levels imposes a set of requirements such as being integral and developmental. Integral, as several dimensions of the teacher's personality are assessed. Developmental, as it takes place in the teacher's ZPD, guided by SCOPA, which is not directed at what he has mastered, but at his potential to develop new thoughts (Galperin, 2023).

The diagnostic process we present is organized into three stages, which are: a) Definition: delimitation of the diagnostic object, definition of its purposes, instruments and techniques, and qualitative indicators of the levels of development of the reference; b) Application: collection of information using defined instruments and techniques, organization of information; c) Analysis and decision-making: the data are conveniently processed and analyzed, determining the levels of development of the PPD (which includes the solution of problem situations) and conclusions are reached that guide what to do didactically (decision-making decisions) for professional teacher training (Núñez, 2018).

Based on Galperin's method (1992b; 2023), the formative diagnostic experience is proposed to be carried out according to the following steps:

- 1 – Determine the general intellectual (mental) action and concepts appropriate to the PPD to be diagnosed.
- 2 – Determine the quality of the PPD according to the indicators (quality parameters).

- 3 – Create a detailed model of general action orientation (operational model of thought – SCOBA), which allows for diagnosis, and represent it in a schematic, materialized form, as a reference for the process.
- 4 – Define the instruments for diagnosis.
- 5 – Develop and validate the system of tasks (problem situations) of the professional activity necessary for the diagnosis.
- 6 – Create initial motivations (which must continue throughout the process).
- 7 – Apply the instruments created according to the moments defined in the Galperin method in the formative diagnosis activities, corresponding to: form of thought without some type of support and external help, form of communicated thought and form of thought with support from SCOBA.
- 8 – Analyze the results and characterize teachers' PPD development levels.
- 9 – Develop possible explanations for the levels of development of the characterized PPD.

These diagnostic stages are dynamic, and one or the other can be readjusted or reformulated during the planning and implementation process.

#### **4.1 The stages of diagnosis in the formative experience**

##### **4.1.1 Determine the intellectual (mental) action appropriate to teacher's professional thinking**

From a psychological point of view, it is necessary to understand what the diagnosis includes and what results are expected to be obtained, that is, to highlight the model of reference thinking according to Galperin's theoretical system. According to Galperin's method, when diagnosing PPD, its object must be defined, as it is a complex, multidimensional and polysemic category. Considering the nature of PPD, the diagnosis is always referred to a given general intellectual action associated with the general concepts that are included in it for the solution of problem situations in professional activity.

##### **4.1.2 Define the quality of the PPD according to the primary indicators (parameters)**

According to Galperin's ideas (1992b), the diagnosis of conceptual thinking is carried out according to certain interrelated indicators, or quality parameters, to characterize teachers' levels of intellectual development.

Galperin (2023) researched and defined qualitative indicators of thinking, differentiating those that can be formed directly or indirectly. The indicators of the first group were called primary and those of the second, secondary, not because of their importance in relation to the quality of the action, but rather because of the direct or indirect influence of the process on their formation. The primary indicators are: the form of the action, the level of generalization, the detailed or reduced character of the action, the level of assimilation, the level of independence and criticality. These are indicators to be taken into account when diagnosing the orientation of type III action depending on the objectives of the process. As secondary indicators, the rational character, the level of consciousness and the level of solidity were included, which are those that are formed not directly, but as a consequence (derivation) of the formation of the primary indicators. The secondary properties of orientation derive from the combination of the primary ones.

When defining the SCOPA model, the parameters of quality of thought must be established (Galperin, 1992a). In this way, a thinking model is characterized for a specific group of problem situations (validity) according to a certain quality, according to pre-determined criteria, which should allow for the solidity and reliability of the diagnosis, as research has shown by Núñez & Ramalho (2019a) and Núñez (2018).

It is worth noting that these parameters are not necessarily the only ones that can be used, everything will depend on the objective of the diagnosis. As Galperin (2023) warns, thinking has different characteristics that can also be indicators of quality, such as being creative, systemic, critical, reflective, among others. The important thing is to have at this stage, a definition of the general intellectual action and the system of concepts that are expressed in SCOPA, with its quality established, which constitutes the object of the diagnosis.

### **4.1.3 Create a detailed model of general action orientation (operational model of thought – SCOBA) as a reference for diagnosis**

Good diagnosis requires objectivity, that is, it depends on the precise formulation of objectives and indicators that allow guiding the process. In the understanding of Núñez, Pereira & Barros (2024), conceptual thinking is thought in action, it reveals itself in the solution of certain problem situations, in our case, of professional activity, which is why the generic use of PPD is inappropriate. For this purpose, we assume SCOBA as the reference, that is, the model of thought in which concepts such as theoretical system and general action (which includes a system of operations) that are desirable for PPD are implicit. The use of SCOBA provides the diagnosis with a multifunctional character, due to the possibility of characterizing levels of development not only of conceptual components of thought but also of the actions and operations through which they are used, that is, the reasoning and thought strategies necessary to solve certain professional problem situations.

Diagnosing the level of development of the PPD involves proving its functionality, that is, the possibilities of thinking with theoretical concepts and general intellectual actions in solving problem situations of professional activity in which they are necessary. In activities to resolve these problem situations, teachers are required to anticipate and plan the necessary operations to resolve them in close conjunction with conceptual aspects, which concerns the orienting basis of action as an orienting image, which relates to a given level of development of thought. These levels are evaluated in relation to the SCOBA model.

This stage of the formative experience must be completed with the quality indicators defined in the thought to be characterized. As argued in Galperin's method, it is not enough to define the thought model. It is necessary to make its quality explicit, as these will be the criteria for the task system to be used in the process, according to Núñez, Pereira & Barros (2024).

### **4.1.4 Define the instruments for diagnosis**

In the formative diagnostic experience that is presented, several instruments are combined that meet in a certain way the demands of the complexity of the PPD, always recognizing the possibilities and limitations of each instrument. This combination is necessary to reduce the possible limitations of each of the instruments to be used.

As instruments for diagnosis, the following are proposed: observation of the process; pedagogical tests, which include assessment tasks; interviews, to clarify and supplement information; teacher's portfolio, as a record of productions during the process; questionnaire, to evaluate the training experience.

It is important to point out that each instrument has a function within the set, which is why any “methodological activism” must be avoided, so that they are all, together, as a system, sufficient for the intended diagnosis. Although these are recommended instruments in the formative experience, others cannot be ruled out, whenever necessary and respecting the nature of the PPD and the objectives of the diagnosis.

#### **4.1.5 Develop the system of tasks (problem situations) of professional activity necessary for diagnosis**

One step in the formative experience is the development of the task system. In Developmental Didactics based on the ideas of Galperin (2023), tasks are the cell of the diagnosis process. The tasks are aimed at characterizing the levels of development of quality indicators and must respond to certain theoretical-methodological requirements, an issue discussed by Núñez, Pereira & Barros (2024).

The tasks for diagnosing PPD must take into account its nature and structure, as well as the specificities of the situations, the knowledge, the general actions in which they are included, the disciplinary areas, the type of professional thought that is the subject of the diagnosis, among others. In turn, a generic diagnosis of thought is impossible, because, as Galperin (2023) warns, thought as an essence reveals itself in certain processes, in a situated way, in the solution of certain problem situations of a contradictory

nature, which is why it needs a system of tasks that can characterize a PPD with a high level of generalization, typical of OBA III, according to the SCOBA model as recommended by Nechaev (2015) and Talízina (1984).

For the diagnosis and characterization of thinking, according to Talízina (2023a), it is necessary to develop a system of appropriate tasks in relation to the objective of the diagnosis. This process, in the formative experience, requires three important characteristics from the instruments, which, according to Talízina, are validity, reliability and solidity. Although they are widely discussed (Reshetova, 1985) under the diagnostic method of the Galperin School, these instrument quality criteria can gain new meanings depending on the nature and objectives of the process.

The validity of the instruments refers to the adequate correspondence of the activities (tasks) used to characterize the orientation domain (thinking) with the objective and the SCOBA model, when it is a type III orientation (Núñez, 2018). According to Talízina, two types of validity must be considered, both articulated: content and functional. The first refers to the domain of the content of the object model in SCOBA, that is, the conceptual domain, of the content of the general structuring concept linked to thought. The second, functional validity, concerns the domain of the action model (system of more particular actions and/or operations) of SCOBA. In other words, to what extent the tasks used in the diagnoses allow (and evaluate) correspondence with the objective and content of the SCOBA model.

The solidity of the diagnosis (reliability), which corresponds to the stability obtained in it, that is, the quality attributed to the results, does not change relatively easily from one evaluator to another. Reliability represents, in this sense, the consistency of the results of applying the instrument.

#### **4.1.6 Create motivations for and during diagnosis**

It is important to highlight that interest, motivation, needs, as aspects of human activity, cannot be disregarded in the diagnosis (Talízina, 2023a). The tasks must also be sources of motivation for teachers in the face of the situations

they must resolve. According to the ideas of Majmutov (2016) and Matyushkin (2009), the use of problem situations contributes to motivation for learning. It is necessary to characterize the motivation to think about solving problem situations in diagnosis (Gilmanshina, 2008) as an essential condition for the inducing component of personality. Faced with the contradictions and problems associated with problem situations, conflicting thoughts arise and linked to them, different qualitative characteristics of emotions and needs. As admitted by Galperin (2023), the quality of a new thought depends on the motivation under which it is carried out. Consequently, inadequate motivation can interfere and make it difficult to diagnose teachers' PPD.

#### **4.1.7 Apply diagnostic instruments according to the moments defined in the Galperin method**

The diagnosis of the level of development of thought, taking SCOBA as a reference, due to its developmental character, is carried out based on the ZPD concept, which is why it is not reduced to the application of instruments, but its formative character makes it a process in which the teacher solves the tasks in the ZPD.

Diagnosis based on the ZPD involves solving tasks on different planes of thought and with, or not, different levels of help. When taking SCOBA as a reference, according to certain pre-established quality parameters and according to Galperin's method, the diagnosis follows the opposite path to that of thought formation: it is first diagnosed from higher levels of desired mastery of thought to, in then move to lower levels, always in relation to quality parameters.

The tasks should initially aim to verify the possibility of resolving problem situations related to PPD on the mental plane, without some type of external help, and move on to diagnosis in the form of communicated thought, with help on this interpsychological plane. Finally, if the demands of the previous forms have not been met, the tasks are requested to be solved at the



lowest level, that of thought with materialized support (SCOBA support provided in a schematic form) of thought.

As discussed, this stage is not limited to the application of the instruments, but to knowing and characterizing the dynamics of the processes in which the application of the instruments is inserted. It is necessary to characterize each moment, the reactions and dispositions of teachers, doubts, different participations, communicative interactions, motivations, rhythms, and task solution times, among other dimensions necessary to qualify the PPD as a whole in the process linked to the requirements discussed in item 4.1.4. It is essential to consider intentional (non-manipulative) and empathetic relationships between subject (trainer) – subject (teachers) as an interactive process, as a space for knowledge production in which communication starts to have an intrinsic methodological function.

#### **4.1.8 Analyze the results and characterize PPD development levels**

In the formative experience, analysis of results is based on dialectical qualitative epistemology that assumes the constructive-interpretive and contradictory character of knowledge, which implies understanding it as a production of a contradictory nature and not just as a linear reality that reveals itself to the researcher in the diagnosis process, in correspondence with the ideas of Ortiz (2015).

Data analyzes can be carried out, among others, in two directions: a) comparing student responses with the content of SCOBA; b) establishing response categories using content analysis (Ortiz, 2015). In this qualitative analysis, not only correspondences with the reference thought model should be highlighted, but also absences, errors in responses and other different types of reasoning.

In the formative experience, the levels of development of thinking related to a given dimension or its completeness are established by comparing the content of SCOBA with the answers, in an integrated way, in the answers to questions from different research instruments, which allows a

greater reliability of the results of the diagnosis of thinking under the adopted framework.

As part of the analysis of results, the analysis of errors must be included, both those of a conceptual nature and those related to actions and operations (reasoning), according to the SCOBA model. Núñez & Ramalho (2020b), based on Galperin's propositions, highlight that teachers' errors in solving problem situations are the result of inadequate orientation. In this way, errors are identified and classified (deviations in the response in relation to expectations), and inferences are made, based on the literature, about possible causes (learning difficulties) that can explain the deviations in orientation.

For a more integrated view and greater credibility of the results of the PPD development levels, the responses from the different research instruments were triangulated. The triangulation of responses in the different instruments (Ortiz, 2015) allows for a greater plurality of perspectives in diagnosing PPD levels, thus providing more detailed, in-depth analyzes of this thinking and greater credibility in the analysis, as it can minimize possible inconsistencies and limited or inadequate interpretations.

#### **4.1.9 Elaborate possible explanations for the levels of development of the characterized PPD**

The diagnosis of PPD under a formative experience can have different purposes, which will determine the ways of explaining the levels of its development under study. If, in the previous stage, exhaustive analyzes of the information obtained in each instrument were carried out (pedagogical tests, observations, portfolios, interviews, questionnaires and others and in an integrated manner), in this stage the established levels of development of the PPD must be analyzed and explanations drawn up that allow us to understand these results according to the objectives of the diagnosis as pointed out by Núñez & Ramalho (2019a).

Whether a diagnosis is necessary for the organization and development of new PPD formative processes, or at the end of it, the PPD must be characterized for decision-making by trainers and teachers themselves in relation to their self-

awareness and development professional. The results, in turn, should lead, as stated by Núñez & Ramalho (2019a), to a review of the formative experience for its continuous improvement.

#### **4 Final considerations**

The article presents and references a formative experience for the diagnosis of Teacher's Professional Thinking (PPD, in Portuguese) under the conception of P. Ya. Galperin on thinking as a cognitive activity of the teacher's personality and the method of its study. The meaning of the construct of teaching professional thinking, the object of the diagnosis, is discussed based on its essence, structure, and functions. The methodology of the formative experience, developed and experimentally tested, is also discussed, which allows the diagnosis under certain conditions that demarcate possibilities and limitations of the formative experience. The results point to a theoretical-methodological contribution to studies on PPD, as part of teacher training and professional development.

The formative experience of the diagnosis presented in the text does not constitute a method or algorithm, but a proposal that may have a heuristic potential for thinking about its critical and creative transfer to new situations of PPD diagnosis. The stages of the methodology are based on Galperin's method for the study of teacher's thinking due to the importance it has for the training and professional development of teachers under the assumptions adapted in the formative experience.

As it is a model designed for certain conditions, its limits of application must be highlighted, which fundamentally concern two issues: it applies to a given understanding of PPD as a type of teacher orientation activity in situations problem of the profession that must be resolved and is based on the method of studying thought in Galperin's school. Furthermore, this diagnostic model is associated with difficulties that impose limitations that are necessary to overcome in the diagnosis considering the nature and complexity of PPD, which leads to the need for new studies to search for more valid and reliable diagnoses.

The results presented in the article, in terms of a reference for the diagnosis of PPD, are revealing of a given current qualitative moment, within a larger discussion, in relation to this object of study. In its historical-logical

development, as a dialectical spiral, it is one of several possible logical and dialectical responses to the general problem of diagnosing PPD necessary for the study of teachers' professional development.

## Diagnóstico del pensamiento profesional docente como actividad orientadora. Aportes del sistema teórico de P. Ya. Galperín

### RESUMEN

En este artículo se presenta y fundamenta una experiencia formativa para el diagnóstico del Pensamiento Profesional Docente (PPD) bajo la concepción del pensamiento como actividad cognoscitiva de la personalidad del docente desarrollada P. Ya. Galperín y su método de pesquisa. Se discute el significado del constructo pensamiento profesional docente, objeto del diagnóstico, a partir de su esencia, estructura y funciones. El texto también aborda la metodología de la experiencia formativa, elaborada y probada experimentalmente, que permite realizar el diagnóstico antes mencionado bajo ciertas condiciones que demarcan posibilidades y limitaciones de la experiencia formativa. Los resultados apuntan a un aporte teórico-metodológico a los estudios sobre PPD como parte de la formación y desarrollo profesional docente.

**Palabras clave:** Experiencia Formativa; Diagnóstico; Pensamiento Profesional Docente; Método Galperín.

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