

The development of theoretical thinking in school Physical Education: a critical analysis of pedagogical experiences from the critical-overcoming and developmental teaching perspectives

A formação do pensamento teórico na Educação Física escolar: análise crítica de experiências pedagógicas nas perspectivas crítico-superadora e do ensino desenvolvimental

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ABSTRACT

This article presents a critical literature review about pedagogical experiences that aimed to develop theoretical thinking in school Physical Education, based on the critical-overcoming approach and developmental didactics. The selection of the *corpus* took as its starting point the survey conducted by Real and Santos (2021) on knowledge production in the field, from which studies reporting practical teaching interventions with clearly defined theoretical foundations were selected. The findings indicate that, in experiences based on the critical-overcoming approach, the development of theoretical thinking is predominantly postponed until the final cycles of schooling, with a logic that prioritizes empirical thinking in the initial cycles prevailing. It was also found that although studies grounded in developmental didactics often refer to themselves as formative experiments, they do not fully meet the methodological requirements of this theory. It is concluded that significant challenges remain for the implementation of pedagogical experiences focused on developing theoretical thinking, particularly those aiming to conduct formative experiments within the framework of the theory of developmental teaching.

Keywords: Developmental teaching. Theoretical thinking. School Physical Education.

RESUMO

Este artigo apresenta uma revisão crítica da literatura sobre experiências pedagógicas que se propuseram a desenvolver o pensamento teórico na Educação Física escolar, com base nas abordagens crítico-superadora e da didática desenvolvimental. A seleção do *corpus* teve como ponto de partida o levantamento realizado por Real e Santos (2021) sobre a produção do conhecimento na área, a partir do qual foram selecionados estudos que relatam intervenções práticas de ensino com fundamentos teóricos claramente definidos. Os resultados indicam que, nas experiências fundamentadas na abordagem crítico-superadora, o desenvolvimento do pensamento teórico é, majoritariamente, postergado para os ciclos finais da escolarização, prevalecendo uma lógica que prioriza o pensamento empírico nos ciclos iniciais. Verificou-se também que, embora as pesquisas ancoradas na didática desenvolvimental se autodenominem experimentos formativos, elas não atendem integralmente aos pressupostos metodológicos dessa teoria. Conclui-se que ainda há desafios significativos para a implementação de experiências pedagógicas voltadas ao desenvolvimento do pensamento teórico, especialmente aquelas que visam à realização de experimentos formativos nos marcos da teoria do ensino desenvolvimental.

Palavras-chave: Ensino desenvolvimental. Pensamento teórico. Educação Física escolar.

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1 Introduction

The development of theoretical thinking represents one of the current challenges in research within the field of school Physical Education. In a recent analysis, Real and Santos (2021) presented an overview of Brazilian scientific productions based on the critical-overcoming approach and developmental didactics, revealing significant progress in studies on this theme. Given this scenario, it becomes necessary to deepen the analysis of pedagogical experiences that have aimed to foster theoretical thinking in Physical Education, particularly those grounded in the perspective of bodily culture and the theory of developmental teaching.

The analysis presented in this article is part of the research conducted for the doctoral dissertation (Santos, 2021) defended in the Graduate Program in Education of the College of Education at the Federal University of Goiás (UFG). Based on this study, we seek here to highlight the didactic experiences that aimed to develop theoretical thinking in school Physical Education, reflecting on their limitations and challenges for implementing formative experiments from the perspective of developmental teaching.

We acknowledge the historical difficulties in conducting scientific research in Brazil, particularly that which requires researchers to immerse themselves in the concrete reality of schools and to propose pedagogical interventions. In this process, while we formulate critiques of the analyzed experiences, we also adopt a stance of self-critique and recognition: self-critique, as we understand that we often maintain a position of observation in the face of the practical efforts of other researchers; and recognition, for the opportunity to learn from these experiences, even if indirectly.

2 Methodology

This study is characterized as a critical literature review with an analytical-comparative focus, aimed at examining pedagogical experiences that have sought to develop theoretical thinking within the context of school Physical Education. The investigation aims to analyze the theoretical foundations and didactic-

methodological elements of these experiences, based on the critical-overcoming approach and developmental didactics.

The selection of the corpus was carried out based on the systematic survey conducted by Real and Santos (2021), who analyzed the knowledge production concerning the development of theoretical thinking in Brazilian Physical Education. The aforementioned research identified and categorized studies produced in the country on this theme, providing a panoramic overview of theoretical and empirical contributions in the field. Based on this mapping, we selected for analysis the works that develop practical teaching experiences explicitly grounded in: (1) the critical-overcoming approach; and (2) the theory of developmental teaching, with the proposition of formative experiments.

Studies published between the years 2000 and 2020 were considered eligible, including scientific articles, dissertations, and theses. The inclusion criteria were: a) to present experiences of concrete pedagogical intervention or didactic proposals organized based on teaching plans; b) to be theoretically grounded in the critical-overcoming approach or in Davydov's developmental teaching theory, which present proposals or analyses of pedagogical practices aimed at developing theoretical thinking in Physical Education; c) to have the development of theoretical thinking as their central focus.

Below we present the table containing the works selected for analysis, organized by theoretical approach and type of experience:

Table 1 – Studies selected for critical analysis

Author(s) / Year	Theoretical Approach	Educational Level	Teaching Object	Type of Experience
Lorenzini (2013)	Critical-Overcoming	Early and Final Years of Elementary School	Gymnastics	Empirical intervention in public schools
Oliveira (2017)	Critical-Overcoming	Higher Education	Game	Didactic proposition (without empirical application)
Teixeira (2018)	Critical-Overcoming	Early Childhood Education	Body culture	Theoretical proposition for curriculum organization
Ferreira (2010)	Developmental Teaching	Early Childhood Education	Body movement	Didactic action inspired by a formative experiment
Miranda (2013)	Developmental Teaching	Elementary School	Volleyball	Didactic action inspired by a formative experiment
Milak (2018)	Developmental Teaching	Early Years of Elementary School	Game	Didactic action inspired by a formative experiment

Source: Elaborated by the author (2025)

The analysis adopted a comparative perspective, aiming to discuss the extent to which the described pedagogical experiences concretize the principles of theoretical thinking formation according to the investigated approaches. This methodological approach made it possible to identify convergences, contradictions, and gaps in the experiences under analysis when compared with the perspective of theoretical thinking formation from Davydov's viewpoint (1988).

3 Experiences from the Critical-Overcoming Perspective

As the first aspect to be examined in this article, we address the didactic experience grounded in the critical-overcoming perspective. The analysis developed here focuses on the didactic elements of the proposal, given that the theoretical foundations of this approach have been thoroughly discussed by Santos

(2021). We identify that the limitations in the formation of theoretical thinking, previously noted within the conceptual domain, are also manifested in the didactic organization of teaching.

Scientific production grounded in the concept of corporal culture² tends to postpone the development of theoretical thinking until cycles III and IV of schooling, focusing instead on adolescence. From a pedagogical standpoint, a structure of teaching work is observed that begins with the immediate, the apparent, and the sensible — that is, with empirical learning — as a necessary condition for subsequently attaining theoretical thinking. However, according to Davydov (1988), the development of theoretical thinking in school does not depend on a prior empirical stage; although it assimilates positive aspects and means of empirical thinking, theoretical thinking resolves its particular problems in its own manner, with greater completeness and effectiveness.

To deepen the analysis of the didactic limitations of the critical-overcoming perspective, we have based our work on the pedagogical experience documented in the study by Lorenzini (2013). This constitutes a relevant empirical investigation, carried out in three public schools in the State of Pernambuco, which involved teaching school gymnastics as a specific content of Physical Education.

One of the aspects that lends robustness to the research is the well-established connection of the teachers with the participating schools and classes: all of them had already been working in the schools for at least two years, which guaranteed a didactic continuity essential for the development of the proposal. The empirical data presented in these studies offer important contributions to understanding the pedagogical approach to gymnastics from the perspective of corporal culture. However, despite the relevance of the experience, we observe that the didactic organization of the content follows a logic of development by stages, in which *empirical learning occupies the initial cycles, while theoretical learning is reserved for the final cycles of schooling*.

² According to the Collective of Authors (1992, p. 38), Physical Education is understood as a pedagogical practice that thematizes, within the school environment, forms of expressive bodily activities — such as games, sports, dance, and gymnastics — which constitute a field of knowledge known as corporal culture, recognized as the object of study of the critical-overcoming approach.

Based on the class reports, it is identified that the development of the pedagogical work in cycle I is oriented towards empirical learning, centered on the immediate and perceptual apprehension of reality, and not towards conceptual or theoretical thinking. This assertion is evident in the following statement by the author:

The content was addressed through definitions that precede concepts, not in isolation, where syncretism was progressively developed through practical experiences with gymnastics. The work focused on the foundations expressed in the different possibilities of the children's bodily actions, which were questioned with the aim of identifying similarities and differences within the content of gymnastics (jumps, spins, balances, swings, climbing...) (Lorenzini, 2013, p. 159).

The excerpt demonstrates that, for Lorenzini (2013), cycle I should focus on the syncretic aspects of knowledge, prioritizing the development of empirical thinking — that which concentrates on the apparent, sensory, and immediate factors of objects (Davydov, 1988). In this sense, by proposing the identification of similarities and differences related to the content of gymnastics in school Physical Education, the author makes clear that the formative objective is centered on the empirical appropriation of the content. The classroom procedure was characterized as a "thoughtful practice of gymnastics," which sought to combine dialogue and bodily participation with experiences of different possibilities for performing gymnastic movements in the available school spaces or in non-school locations visited during the period.

The implementation of the synthesis for this period is another demonstration of the aim to develop empirical thinking, which according to Lorenzini (2013), is characteristic of the representations and analogies of cycle I, with the objective of identifying the knowledge/content of gymnastics by contextualizing and relating it to daily life. Although some objectives outlined for the cycle require the explanation of certain situations, what is ultimately achieved through the pedagogical approach employed is empirical thinking.

After a significant sequence of classes — 28 lessons — which even extended beyond the limits of a single grade/year, thereby demonstrating an

advancement in the continuity of systematic Physical Education instruction, Lorenzini (2013) concluded that the outcome of this entire process is the development of empirical thinking.

Two problematic aspects draw our attention, as they help to explain what we are referring to as empiricism in the pedagogical approach to Physical Education. The first is the deliberate pursuit of forming thought representations, aimed at cultivating empirical thinking: an empirical stage. In this context, representations constitute immediate, empirical thinking, and in the experience under review, according to Lorenzini (2013, p. 165), "the formation of representations related to gymnastics was demonstrated in the students' explanations concerning the content." The second aspect is the consideration of the empirical, daily, and sensory as the starting point for school pedagogical work, intended to lay the foundation for theoretical thinking, which will only be developed in cycles III and IV.

Even in the second cycle, the perspective of developing empirical thinking remains predominant. Lorenzini (2013, p. 165) understands this stage as the beginning of generalizations and initial concepts, albeit generalizations that are "characteristic of the visible and/or projected concrete." The development of thought occurs through comparison and the "confrontation of knowledge between gymnastics and dance," with the aim of identifying the "visible differences" between these two teaching contents — a procedure characteristic of empirical thinking. Thus, not even in the 7th grade (formerly the 6th grade) does the author advocate for the necessity of developing theoretical thinking, but rather continues with empirical thinking, grounded in the apparent relationships between objects in reality.

Lorenzini (2013) explicitly states that she develops the pedagogical work with the aim of achieving the expected objectives for a given cycle, still based on the Collective of Authors (1992)³. And the type of thinking that is expected is not

³ The work *Metodologia do Ensino de Educação Física* (Collective of Authors, 1992) systematizes the theoretical and methodological principles of the critical-overcoming approach and proposes corporal culture as the object of study for school Physical Education, constituting a fundamental reference for scientific production and teacher education in the field.

theoretical thinking — which is only intended for the final cycles — but empirical thinking. As the author states: "The difference in cycle III occurred with the formation of theoretical concepts, pertaining to the specific content produced historically, relating it to other bodily practices" (Lorenzini, 2013, p. 174).

What determines that the formation of theoretical thinking occurs specifically in cycle III? Is it because only at this stage do students possess the cognitive conditions to develop theoretical concepts, analyses, and syntheses, or is it because only now have teachers set the formation of theoretical concepts as an objective?

In our understanding, students develop theoretical thinking only in the third cycle because it is solely at this stage that teaching tasks are structured and organized to require actions that foster the development of such thought. The teaching tasks are entirely distinct from those carried out in cycle I, which are notably oriented towards the apprehension of the immediate and the sensory. In cycle III, students begin to confront tasks that demand reflection on the causes of phenomena, historical analysis (such as that of gymnastics), conducting research, and engaging in problematizations that lead them to establish complex conceptual relationships. These requirements transcend the limits of empirical learning, marking a qualitative transformation in the teaching process.

At the level of in-depth study, cycle IV, another significant procedure emerges to confirm the conception that it is only at this stage that study tasks aimed at theoretical thinking are developed: school research as a principle of learning. Students were more rigorously challenged, meaning they had to produce written theoretical works on the content of their research, requiring from them actions and operations that surpassed the empirical level.

Similarly, it was only in this cycle that the encouragement of student autonomy was observed. In the proposal for the self-organization of the planning and execution of the corporal culture festival at the school, for instance, the students themselves organized and developed the activities and fulfilled tasks across all functions. At the end of the cycle, they produced a written group

evaluation synthesizing their reflections on the festival. Furthermore, these elaborations were shared in a seminar format.

In our analysis, it becomes evident that the experience of Lorenzini (2013) follows a progressive logic of thought formation, structuring the pedagogical work in a movement that proceeds from the empirical to reach the theoretical. As the author herself summarizes, in cycle I, initial representations are developed; in cycle II, generalization processes begin; and only in cycles III and IV is conceptual thought effectively consolidated — a stage which enables students to identify and understand the scientific regularities inherent to the contents studied.

Another study grounded in the Critical-Overcoming approach, from the perspective of theoretical thinking formation, is that of Oliveira (2017). However, it is important to note that this study does not discuss school Physical Education, but rather teacher training. Furthermore, it is observed that the research in question does not report a concrete experience, but instead presents a proposition for organizing the teaching of games. This elaboration is included in the discussion on pedagogical experiences because it presents relevant problematic aspects that demand attention when reflecting on the formation of theoretical thinking in Physical Education, both in basic and higher education.

The methodological path for teaching games establishes empirical learning as a necessary stage for the formation of theoretical thinking. From this perspective, the formation of scientific concepts initially proceeds from the apprehension of apparent and sensory characteristics, taking the students' everyday knowledge as the starting point for the teaching process — a principle which reaffirms the successive character (Davydov, 2017) in Physical Education classes.

In developing his teaching proposal, Oliveira (2017) employs the methodological procedures of historical-critical pedagogy. The author does not discuss these methodological procedures, arguing that this discussion is already well-established in the literature. His focus lies in presenting an organization for teaching games in higher education that is aligned with historical-critical pedagogy. Although it is not the objective of this study to analyze all elements of

the author's proposal, it is important to highlight that it presents relevant aspects for teaching games in teacher training. In this work, we will prioritize the analysis of the didactic aspects that, in our assessment, also reveal limitations concerning the formation of theoretical thinking.

We identify as problematic the elements that constitute the starting point of the instruction — specifically, the apparent and empirical aspects of reality. This initial approach proves to be inconsistent both with the premises of the theory of developmental teaching, as founded in Davydov (1988), and with the principle of the initial social practice in historical-critical pedagogy (Galvão; Lavoura; Martins, 2019). Additionally, it is observed that the endpoint also presents a significant theoretical limitation.

For Oliveira (2017), the endpoint of the educational practice — understood as the final synthesis — consists of the materialization of a toy or game. The author interprets this concrete production as the expression of the dialectical unity between empirical and theoretical thinking within the process of thinking and action. Let us examine how this articulation is developed:

The process of producing this didactic-pedagogical material (a critical game or toy) presents objective possibilities for mastering human capacities in their development concerning the reproduction of the concrete and real, in a manner that overcomes empirical thinking and the speculations generated by reality. The transition from empirical (and real) thought to scientific thought, through the development and materialization of a toy or an original role-playing game, aims — starting from *the initial social practice* [...], through *problematization* and *instrumentalization* to reveal the nature of teaching and learning within the process pertaining to *catharsis*, allowing for a return to the same *social practice*, but now as an endpoint, systematically incorporating social reality into a toy (Oliveira, 2017, p. 220, author's emphasis).

The methodological procedure described presupposes a mandatory trajectory that proceeds from the empirical to attain the theoretical. This progression begins with the initial social practice — represented by the students' everyday knowledge — and culminates in the final social practice — expressed by theoretical thinking materialized in the construction of a critical toy or game.

It is reiterated that the analyzed proposal does not establish an adequate relationship with the principles of developmental didactics. Oliveira (2017) draws upon a quotation from Davydov to substantiate his proposal for the development of a concrete object. However, a rigorous analysis of the cited text reveals that Davydov (1988, p. 143, author's translation) advocates precisely the opposite of what the author intends to support. As Davydov explicitly states (1988, p. 143, author's translation):

[...] empirical-type abstractions do not serve this purpose [of reproducing the concrete], because they are destined only to classify objects. To reproduce the concrete is indispensable an initial abstraction to which characteristic properties are inherent.

What is expressed in Davydov's (1988) thinking, therefore, is the movement from the abstract to the concrete, not as a material, sensible object, but as a concrete thought.

In the concluding considerations, what we characterize as empiricism in the scientific production of Physical Education is evidenced with greater clarity, as explicitly stated by Oliveira (2017, p. 237):

We recognize that the process of apprehending the Game begins with its apparent features, that is, with the empirical characteristics grasped through sensation and only through the process of abstraction can we recognize what is universal in its content. The movement of thought that starts from the apparent concrete, advances toward abstractions, and then returns to the concrete as a mental synthesis, to a knowledge that is now structured in relation to the connections with the mode of production of existence.

Our understanding, which diverges from the perspective presented by Oliveira (2017), is grounded in the discussion of the formation of theoretical thinking according to the davydovian theory and, within the specific domain of Physical Education, in the studies of Nascimento (2014). As this author demonstrates, any analysis of the objects of study in Physical Education — taking games as an example —,

[...] will start from one or another abstraction of these activities, that is, from a trait or characteristic abstracted from the totality of bodily culture practices. However, to understand the essential relations that constitute such activities, it is not sufficient to take any abstraction as the starting point for analysis (Nascimento, 2014, p. 38).

Furthermore, by adopting the most immediate and empirical manifestations of these activities — that is, the empirical manifestations of these objects — as a starting point, we will also formulate a set of empirical, but not theoretical, representations. As Nascimento (2014, p. 38) cautions in her analysis of the theoretical appropriation of bodily culture activities:

[...] if we wish to conduct a theoretical analysis of bodily culture activities, it is necessary to begin this analysis with a trait that is itself essential to the phenomenon; with a relation that is necessary for the existence of bodily culture activities as such and that, simultaneously, contains within itself the potential to create the diverse and multiple forms of existence of such activities. It is imperative to begin from a substantial abstraction, one that represents the substantiality of the phenomenon, the essential and necessary relations for its emergence and development.

Another relevant study from the Critical-Overcoming perspective is the work of Teixeira (2018), which presents significant research on Physical Education in Early Childhood Education. The author argues that the systematic teaching of bodily culture should be part of the Early Childhood Education curriculum. In this elaboration, the author updates the proposal for the first cycle regarding its structure and conception, advocating for a form of teaching that integrates technique, motor skills, and concepts.

A significant movement is therefore observed among researchers of the critical-overcoming perspective towards articulating the premises of historical-cultural theory with the teaching of school Physical Education. The study by Teixeira (2018) — although it does not present a concrete teaching experience, which is the reason we have not engaged in a more detailed analysis of it in this article — provides an indispensable parameter for: (a) the reflection on Physical Education in Early Childhood Education in light of

historical-cultural theory; and (b) the discussion on the organization of school cycles. By undertaking the effort to update the first cycle, the author highlights the necessity of extending this revision to the remaining cycles, taking into account the advancements made by studies such as those of Melo (2017) and Lorenzini (2013).

While we acknowledge the importance of the research analyzed from the Critical-Overcoming perspective — an approach that underpins our own pedagogical practice —, our investigation reveals a conceptual divergence regarding the formation of theoretical thinking. We maintain that study activity, as the leading activity of development, constitutes the central element for the construction of theoretical thinking from the initial stages of schooling, as its essential core lies precisely in the appropriation of theoretical concepts (Santos, 2021).

This understanding is grounded in the theory of developmental teaching, which establishes study activity as the structural axis of the process of conceptual appropriation from the early school years (Davydov; Markova, 1987). This theoretical perspective offers significant contributions for advancing the debate on the teaching of bodily culture in school Physical Education.

4. Didactic experiences from the developmental perspective

When examining empirical research that has conducted pedagogical experiments based on developmental didactics in Physical Education, we question whether such initiatives truly constitute formative experiments⁴ according to the premises of historical-cultural theory. This problematization arises from the need to verify the extent to which these experiences incorporate the principles of developmental didactics and effectively promote the formation of theoretical thinking.

⁴ The didactic approaches of Ferreira (2010), Milak (2018), and Miranda (2013) were analyzed in this article solely with regard to their relationship with the implementation of formative experiments. Other aspects related to the appropriation and development of theoretical thinking were analyzed and discussed in Santos (2021).

As the first study to implement a pedagogical experience articulating developmental didactics with school Physical Education, the research by Ferreira (2010) holds particular relevance. The author explicitly grounds her investigation in historical-cultural theory and, specifically, in Davydov's postulates on developmental teaching. Within this theoretical framework, Ferreira (2010) characterizes her intervention as a formative experiment.

We identified weaknesses in the understanding of the formative experiment in the research by Ferreira (2010). In our assessment, the author does not adequately appropriate the method proposed by Davydov, limiting herself to using only one characteristic of the experiment, namely: intervention with the research subjects. This partial appropriation is evidenced by the selection of quotations from Davydov (1988) used by the author, which are restricted to: (1) the active intervention of the researcher; and (2) a general definition of the formative experiment method. As expressed by the author herself:

This method is based on the organization of new educational and instructional programs and the procedures for their implementation. Experimental teaching and education are not implemented by adapting to an existing, already formed level of children's mental development, but rather by utilizing, through the teacher's communication with the children, procedures that actively form a new level of capacity development within them (Davydov, 1988 *apud* Ferreira, 2010, p. 80).

It is noteworthy that the author omits a critical analysis of this essential passage, which, in our understanding, clarifies a core principle of the formative experiment, namely, that its foundation lies in the organization of new educational and instructional programs that do not adapt to the existing developmental level. The experiments conducted within the theory of developmental teaching are the result of a profound transformation in the structure of educational organization, instructional programs, and methodology (Davydov; Markova, 1987). Consequently, these elements constitute essential characteristics of the formative experiment from the developmental perspective, contrasting with the approach adopted in Ferreira's (2010) study.

The second research that sought to develop a formative experiment within the scope of Physical Education, based on the foundations of Davydov's theory of developmental teaching, was that of Miranda (2013). We identified that this also does not constitute a formative experiment, but rather a didactic action involving the application of lesson plans from a given theoretical-methodological perspective, which is not coherently grounded in historical-cultural theory.

The understanding of the formative experiment is defined by Miranda (2013, p. 112) as follows:

The didactic-formative experiment is a special research method that consists of studying, in a real situation, changes in the development of students' mental actions through the intentional influence of the researcher. The experiment, based on a teaching plan, makes it possible to monitor students' progress in their tasks, gathering data based on the interpretation of events involving the organization of teaching and students' responses.

The characteristic that Miranda (2013) emphasizes in the formative experiment is also its active nature in the investigation of educational phenomena. This means that the researcher plays an active role in the processes being investigated. Relying on Davydov (1988), she further states that the method aims to facilitate the formation of theoretical thinking through learning activity. According to him, what is obtained from the experiment are the reports of the actions and observations made by the researcher regarding the phenomenon under development, based on the teacher's performance.

The third research project that proposed to conduct a formative experiment in Physical Education was that of Milak (2018), focusing on the teaching of games. However, the author herself demonstrates an awareness of the research's limitations, as she explicitly states:

[...] We drew inspiration from the method used by Historical-Cultural theory, while being aware that, aside from not having

professionals from various fields of knowledge, we did not have sufficient time to conduct an experiment on the scale undertaken by Davýdov and his followers. Furthermore, the experiment took place in only one discipline, in isolation. Therefore, we know that an in-depth analysis of psychic development will not be possible (Milak, 2018, p. 34).

In our understanding, this quotation from the author clearly summarizes the limitations of the research that implemented pedagogical intervention proposals in the school context — limitations that prevent them from being characterized as true formative experiments, according to the theory of developmental teaching. We consider that such studies actually align with the conception of Libâneo (2000 *apud* Ferreira, 2010, p. 80), namely:

[...] it is a proposal for pedagogical intervention previously prepared by a researcher, who then proposes it to a teacher to be developed in the classroom over a delimited period of time. [...] It is a pedagogical intervention through a specific teaching methodology, aiming to interfere in mental actions and provoke changes in relation to expected future levels of mental development (Libâneo, 2000 *apud* Ferreira, 2010, p. 80).

The analyzed conception elucidates the procedures carried out in the investigations by Ferreira (2010), Miranda (2013), and Milak (2018), presenting a definition that more accurately expresses the nature of these studies.

Although Libâneo's conception (2000 *apud* Ferreira, 2010) represents the most appropriate approximation to what the research demonstrated, it is imperative to propose a reformulation of its definition. This necessity arises primarily because these studies failed to fulfill a fundamental requirement of pedagogical intervention: minimal interaction with other school professionals and with the institutional pedagogical proposal. As Ferreira's own work (2010, p. 107) explicitly acknowledges, there was no articulation with other curricular components or with the other educators at the institution.

Not even within the internal institutional framework was a collaborative effort undertaken. The political-pedagogical project of the institutions was not analyzed or respected, even though it represented a different pedagogical proposal. Furthermore, there was no dialogue with other school professionals — principals, pedagogical

coordinators, or teachers from other knowledge areas. What was observed was an articulation with other methodologies, aiming to incorporate methodological procedures that differ from the didactic perspective of Davydov (1988).

Secondly, because the didactic interventions were isolated, momentary, and confined to only one teaching object within Physical Education. The didactic intervention by Ferreira (2010) was carried out in a single school, with the participation of only nine students aged 4 and 5. The lessons were systematized by the researcher based on developmental didactics and implemented by the school teacher during regular Physical Education classes, focusing on body movement as the teaching object. The didactic intervention by Miranda (2013) consisted of a proposal developed in a single sports school class, with the collaboration of the volleyball teacher. Similarly, the didactic intervention by Milak (2018) was also conducted in a single school in 2017. This intervention was carried out with children from the first and second years of Elementary School, involving only 12 students in each class, and aimed at teaching games.

Another aspect highlighting the isolated nature of the experiences, which limits their characterization as formative experiments in the conception of Davydov (1988), was the short duration of the school interventions, revealing the transient character of the studies. The didactic intervention by Ferreira (2010) consisted of only nine lessons. The experience of Miranda (2013) totaled 30 lessons, each lasting 1 hour and 30 minutes. The proposal by Milak (2018) involved a larger number of interventions: 52 class hours (each of 45 minutes) per group, with a weekly frequency of 3 class hours.

The understanding we have gained of formative experiments within the theory of developmental teaching allows us to assert that *the didactic actions in the field of Physical Education are isolated, punctual, and restricted*. They are isolated because they did not involve dialogue with other professionals in the institution; punctual, as they were transient and momentary; and restricted, as they addressed only one specific teaching object within Physical Education. Considering these elements, and paraphrasing Libâneo (2000 *apud* Ferreira, 2010), we consider that, within the scientific production of Physical Education

based on developmental teaching, there are proposals for didactic actions previously prepared by a researcher, who then passes them to a teacher to be implemented in the classroom over a delimited period. These are didactic actions carried out through developmental teaching but articulated with other methodological procedures, aiming to interfere in students' mental actions and provoke changes in their levels of appropriation of a specific teaching object in Physical Education. However, such proposals still reveal a dichotomy between teaching and research.

We are not disregarding the positive aspects of these studies, which were conducted in real school contexts — within a school or a classroom — and which richly described the particularities encountered in those specific realities. However, our reflection is grounded in what the researchers themselves set out to accomplish: the formative experiment from the perspective of developmental teaching.

5 Final Considerations

This article aimed to analyze pedagogical experiences in the field of school Physical Education that proposed to develop theoretical thinking, based on didactic proposals developed by researchers who grounded their work in the critical-overcoming approach and developmental didactics, with the purpose of reflecting on the limits and possibilities of these experiences.

We identified that in proposals guided by the critical-overcoming perspective, although there is an appreciation for the systematic teaching of bodily culture, the formation of theoretical thinking still follows a logic in which empirical thinking occupies the initial cycles of schooling, while theoretical thinking is reserved for the final cycles.

Conversely, the experiences grounded in Davydov's theory of developmental teaching presented even more evident limitations regarding the implementation of formative experiments. This is because the analyzed didactic actions were characterized as isolated, momentary, and restricted to a single teaching object. These aspects prevent such experiences from being characterized as formative

experiments within the theoretical assumptions of developmental didactics.

However, we acknowledge that the conducted experiences represent an important effort toward materializing an education that develops theoretical thinking in students. Nevertheless, by maintaining the sensory, immediate, and empirical as their starting point, these experiences replicate a logic that contradicts the foundations of Davydov's (1988) theory. According to the author, theoretical thinking does not depend on a prior empirical stage, although it may assimilate its positive aspects; rather, it is a type of thinking that solves its problems in a more comprehensive and effective manner.

We conclude, therefore, that research within Brazilian Physical Education based on developmental didactics has not yet conducted genuine formative experiments as conceived within the framework of this theory. For this to be achieved, it is necessary to advance in the construction of integrated curricular programs that articulate Physical Education with the totality of the school educational project and that prioritize the development of theoretical thinking from the first years of schooling.

La formación del pensamiento teórico en la Educación Física escolar: análisis crítico de experiencias pedagógicas desde las perspectivas crítico-superadora y de la enseñanza desarrolladora

RESUMEN

Este artículo presenta una revisión crítica de la literatura sobre experiencias pedagógicas que se propusieron desarrollar el pensamiento teórico en la Educación Física escolar, basadas en los enfoques crítico-superador y de la didáctica desarrolladora. La selección del corpus partió del levantamiento realizado por Real y Santos (2021) sobre la producción del conocimiento en el área, a partir del cual se eligieron estudios que relatan intervenciones prácticas de enseñanza con fundamentos teóricos claramente definidos. Los resultados indican que, en las experiencias fundamentadas en el enfoque crítico-superador, el desarrollo del pensamiento teórico es, en su mayoría, postergado para los ciclos finales de la escolarización, predominando una lógica que prioriza el pensamiento empírico en los ciclos iniciales. También se constató que, aunque las investigaciones basadas en la didáctica desarrolladora se autodenominan experimentos formativos, no cumplen íntegramente con los supuestos metodológicos de dicha teoría. Se concluye que aún existen desafíos significativos para la implementación de experiencias pedagógicas orientadas al desarrollo del pensamiento teórico, especialmente aquellas que buscan realizar experimentos formativos en el marco de la teoría de la enseñanza desarrolladora.

Palabras clave: Enseñanza desarrolladora. Pensamiento teórico. Educación Física escolar.

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