
Contributions of the exercise of sociological imagination to the construction of scientific thinking in teacher education

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Abstract

Este estudo destaca o desenvolvimento do pensamento científico como um saber fundamental. This study highlights the development of scientific thinking as fundamental knowledge for teacher professionalization, which is directly associated with the ability to contextualize and problematize the context of action, a necessary skill for reflecting on practice, as well as the construction of problem situations that can mobilize teaching work. It is intended to learn about the contributions of the exercise of sociological imagination to the development of scientific thinking in teacher education. This is a theoretical study with a qualitative approach, in which we use a bibliographic procedure, mainly guided by works on sociological imagination from the perspective of Mills and Giddens. In this context, this manuscript presents the exercise of sociological imagination, proposed by sociologists Charles Wright Mills and Anthony Giddens as a possible procedure for the development of scientific thinking in teachers, which can even be present in teacher formation processes.

Keywords: Sociological imagination. Scientific thinking. Teacher formation. Teacher-researcher.

Contribuições do exercício da imaginação sociológica para a construção do pensamento científico na formação de professores

Resumo

Este estudo destaca o desenvolvimento do pensamento científico como um saber fundamental para a profissionalização docente, diretamente associado à capacidade de contextualizar e problematizar o contexto de atuação, habilidade necessária para a reflexão da prática, bem como para a construção de situações-problema que possam mobilizar o trabalho docente. Tem-se por objetivo conhecer as contribuições do exercício da imaginação sociológica para o desenvolvimento do pensamento científico na formação de professores. Trata-se de um estudo teórico de abordagem qualitativa, no qual utiliza-se o procedimento bibliográfico pautado

principalmente nas obras que versam sobre a imaginação sociológica na perspectiva de Mills e Giddens. Nesse âmbito, este manuscrito apresenta o exercício da imaginação sociológica, proposto pelos sociólogos Charles Wright Mills e Anthony Giddens como procedimento possível para o desenvolvimento do pensamento científico nos professores, que pode, inclusive, fazer-se presente em processos de formação docente.

Palavras-chave: Imaginação sociológica. Pensamento científico. Formação de professores. Professor-pesquisador.

Contribuciones del ejercicio de la imaginación sociológica para la construcción del pensamiento científico en la formación de profesores

Resumen

Este estudio destaca el desarrollo del pensamiento científico como un conocimiento fundamental para la profesionalización docente, directamente asociado con la capacidad de contextualizar y problematizar el contexto de actuación, habilidad necesaria para la reflexión de la práctica, así como para la construcción de situaciones-problema que puedan movilizar el trabajo docente. El objetivo es conocer las contribuciones del ejercicio de la imaginación sociológica para el desarrollo del pensamiento científico en la formación de profesores. Se trata de un estudio teórico de enfoque cualitativo, en lo cual se utiliza un procedimiento bibliográfico y se basa principalmente en las obras que tratan sobre la imaginación sociológica desde la perspectiva de Mills y Giddens. En este ámbito, este manuscrito presenta el ejercicio de la imaginación sociológica, propuesto por los sociólogos Charles Wright Mills y Anthony Giddens como un posible procedimiento para el desarrollo del pensamiento científico en los profesores, que puede, incluso, estar presente en los procesos de formación docente.

Palabras clave: Imaginación sociológica. Pensamiento científico. Formación de profesores. Profesor-investigador.

Introduction

To become a teacher is undoubtedly to enter into a continuous and highly complex formation process that is intrinsically related to the social structures and demands that shape our society, immersed in a scenario of historically constructed obstacles and struggles. Not infrequently, the understanding of the formation processes of these professionals is based on romanticized discourses, associated with the figure of a individual who, by vocation, was born for

the noble mission of educating. Although these discourses show us one side of the profession, they limit our understanding of its broad complexity and lead to the devaluation of teachers.

That's why it's essential to think about teacher formation from the perspective of professional development, aimed at professionalization and based on the knowledge belonging to teachers. In this sense, this study explores the development of scientific thinking as a key element of professionalization, among the various types of knowledge belonging to the teaching profession, by looking at the exercise of sociological imagination, proposed by sociologists Charles Wright Mills and Anthony Giddens, as a possible way of developing this knowledge in teachers, which can even be present in formation processes.

In short, understanding the world from a sociological perspective, based on science, requires understanding and problematizing social complexity, which is revealed in different contexts. For Mills (1959), for example, human consciousness is structured according to our daily lives and experiences. In this way, we have limitations because our interpretations, opinions and decision-making are not based on broader historical and social references. In this way, we don't place the relationship between "man, society and history" at the center of our usual concerns, but we are driven by what is close to us and by immediacy.

These attitudinal responses sometimes reflect our inability to think in a contextualized way and to generate problematization, to the point of making it difficult to elaborate problem situations that could lead us to quality pedagogical practice. Along the same lines, the scientific thinking addressed in this research corresponds to fundamental reasoning and problem-solving strategies traditionally associated with scientific activities, which have contributed to the formation of reflective and research-oriented teachers (Diniz-Pereira; Zeichner, 2017).

In this discussion, this manuscript seeks to establish a relationship between the exercise of sociological imagination and the development of scientific thinking in teacher formation, understanding this knowledge as an element belonging to professionalization, magnifying understandings about the individual-teacher and presenting this dynamic of "sociological imagination" as a strategic possibility in formation processes. Thus, the teacher is placed in

a problematizing and disturbing position, which leads them to look at different dimensions, establishing broader meanings and understanding “[...] history and biography, as well as the relationships between the two, within society” (Mills, 1959, p. 12).

In this way, the aim is to learn about the contributions of the exercise of sociological imagination to the development of scientific thinking in teacher formation. In this sense, this is a theoretical study with a qualitative approach, which uses a bibliographic procedure and is based mainly on works that deal with the sociological imagination from the perspective of Mills and Giddens, the development of scientific thinking and teacher formation, in order to seek answers to the research problem: *what contributions does the exercise of sociological imagination bring to the development of scientific thinking in teacher formation?*

For a reflective reading, this article is organized into sections, starting with the introduction, which presents the starting point for this immersion, highlighting the aim of the study and the research problem that guided the literature search. Then, in the second section, we present the methodological paths taken for its development. The third section shows the theoretical basis, which is outlined in two subsections: i) *Sociological imagination: the construction of sociological thinking* and ii) *Scientific thinking: the formation of the teacher-researcher for the 21st century school*. In the fourth section, the results and discussions arising from all the bibliographic analysis are presented, in dialog with the theories presented for teacher formation. Finally, in the fifth section, we present our final considerations.

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Methodological paths taken

In this study, which has a qualitative and theoretical approach, we used bibliographical research methodological procedures. According to Pizzani, Silva, Bello and Hayash (2012), this type of research is developed as an exploratory immersion in the main theories that guide the research problem, using orderly procedures to search for a solution, always paying attention to the object of study. In view of this, Lima and Mito (2007) highlight the clear definition of at least three procedures adopted: type of research, delimited

universe and data collection instrument, which will involve its execution, showing the guidelines that will support the investigative process and its analysis.

In this discussion, we used books on the sociological imagination from the perspective of Mills and Giddens, the development of scientific thought and teacher formation focused on the professional development of teachers.

Data was collected using three types of bibliographic search: i) works on the sociological imagination by sociologists Mills and Giddens, shown in chart 1; and ii) works on scientific thinking, taken from the Google Scholar database, using the terms and keywords: “scientific thinking” and “scientific research methodology” in/for “knowledge production”. At this stage, we selected, a priori, the ten studies identified as most relevant and read their abstracts/presentations to identify their suitability for the objectives of this research, selecting two books for full exploration, shown in chart 2.

Chart 1 – Studies related to the sociological imagination from the perspective of Mills and Giddens

Work	Authorship	Type	Year
The sociological imagination	Mills	Book	1959
The consequences of modernity	Giddens	Book	1991

Source: prepared by the authors (2022).

Chart 2 – Studies related to the development of scientific thinking

Work	Authorship	Type	Year
Pensamento científico (Scientific thinking)	Bizzo	Book	2012
Metodologia da pesquisa científica: a construção do conhecimento e do pensamento científico no processo de aprendizagem (Scientific research methodology: the construction of knowledge and scientific thinking in the learning process)	Souza; Santos; Dias	Book	2013

Source: prepared by the authors (2022).

Finally, we carried out (iii) an analysis of teacher formation with a focus on teacher professional development, based on the criterion of choosing books that dealt with the formation process aligned with teacher-researcher formation, in which there were manifestations of the influence of research and scientific procedures as key elements for teacher intellectualization and professionalization. These studies are shown in chart 3..

Chart 3 – Studies related to research and teacher formation for professional development

Work	Authorship	Type	Year
○ papel da pesquisa na formação e prática dos professores (The role of research in teacher formation and practice)	André (org.)	Book	2012
Prática Inovadoras na formação de professores (Innovative practice in teacher formation)	André	Book	2016
A pesquisa no trabalho e formação docente (Research in teacher work and formation)	Diniz-Pereira; Zeichner	Book	2017

Source: prepared by the authors (2022).

After selecting the studies, we read and organized the main ideas that corroborate the focus of this research. With regard to the works of Mills (1959) and Giddens (1991), we highlighted quotes that refer to the sociological imagination as an exercise for the development of scientific thinking. With regard to research on scientific thinking, explored in Bizzo (2012) and Souza and Santos (2013), we selected the more conceptual propositions to understand how the development process for this knowledge occurs. In Diniz-Pereira and Zeichner (2017) and André (2012, 2016), we highlighted the potential of scientific research procedures in teacher formation.

From that, we moved on to an analysis of the works highlighted in charts 1, 2 and 3, which we discussed with other researchers who helped us understand the contributions of the sociological imagination to the development of scientific thinking in teacher education. Next, we present some congruences between the theories analyzed.

Theoretical ground

Sociological imagination: the construction of sociological thinking in teacher formation

The sociological imagination can be seen as knowledge that enables social interpretations to be broadened beyond individual perceptions, based on reflective processes (Mills, 1959). It can be seen as a practice, a technique, a skill or even a knowledge, as we have emphasized in this study, with a view to becoming aware of the relationship between the individual and society.

It can start from an exercise that apparently begins in a “simple” way, but ends up becoming a complex and disturbing practice. For example: what does to be a teacher mean to you? What elements are responsible for the feeling of belonging to this group? What constitutes a teacher?

Browsing Google, between November and December 2022, using the search term “What does it mean to be a teacher?”, we came across the website “Mundo das Mensagens (World of Messages)”¹, one of the most accessed web pages on the subject, which offers ready-made and immediate answers to this question. Among them, “to be a teacher is to be a parent, to be a guide who is available for all your students’ difficulties”; “to be a teacher is to teach and educate, but also to learn from your students and constantly renew your learning”; “one who professes a belief, a religion”; “to be a teacher is to leave school and carry in your heart and mind your pupils, their concerns and needs”; “to be a teacher is to give your all every day, asking only in return for the success of those you work so hard to prepare for the future”; “to be a teacher is much more than a profession, it is a vocation, a mission, one of the most important jobs on which the future of a nation depends! And so often it’s also being a father, a mother, a friend...”.

In an attempt to explain the real meaning and significance of teaching, these definitions are traditionally present in many speeches. However, we must emphasize that, although there is some sense in what has been said, these discourses denote a socio-historical construction, of which we were part, and carry among the lines social and political elements that emerge from each context. Furthermore, the figure of the teacher cannot be based solely on moral issues, such as those associated with mission and vocation, because

propositions in this area open up space for domination, exploitation and devaluation of teachers.

This is just one of many examples in which frequent perceptions do not represent the whole of reality. In this sense, Mills (1959, p. 9) points out: “[...] everything that ordinary men are directly aware of and everything they try to do is limited by the private orbits in which they live”. In other words, people rarely understand the complex relationship between their lives and the course of world history.

And how do we exercise the sociological imagination? According to Mills (1959) and Giddens (1991), the development of the sociological imagination takes place through two fundamental elements: estrangement and denaturalization. The authors place these elements as responsible for reflecting the complexity and essentiality of the simplest social phenomena. In this way, to make reality strange would be to take a critical stance towards it and to denaturalize would be to try to explain how phenomena became what they are (Mills, 1959).

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Teachers who are familiar with and make use of sociological analysis are surprised by the results of this practice, because their estrangement starts to broaden their questioning of the social and natural world, making them reflect from new assumptions, so, in this movement of estrangement and denaturalization, the sociological imagination removes them from a passive place, as reproducers of a culture, of a behaviour, of knowledge, and gradually leads them to a place of intellectuality, of critical reflexivity, of actor. After all, according to Mills (1959), it is only possible to understand the world in which we live and its dynamism if we look beyond ourselves.

In this way, the use of sociological knowledge as a practice for elucidating the world and its transformations can be an effective process in the development of fundamental knowledge for teaching practice, enhancing critical reflexivity and the ability to construct problem situations for pedagogical practice.

Giddens (1991) reinforces the potential of this exercise when he states that human behavior is built on this logic, as it leads us to think about the world beyond our personal issues – so that those who look at the world are not stuck in their standard routine – since, as human beings, we tend to be stuck in this personal view, conditioned by an individual affliction, which sometimes

ends up determining our distorted view of the whole. In this way, the sociological imagination is a way of using thought as a creative practice, taking human beings through a cyclical movement of: a) observing; b) describing; c) comparing; d) combining; and e) analyzing, making observable phenomena strange and not natural (Giddens, 1991). Essentially, it is an instrument of sociology that can be integrated into the specific knowledge of different professions, but specifically those born out of the social sciences, such as the teaching profession, which is currently moving towards professionalization, towards its recognition and appreciation.

Scientific thinking: the teacher-researcher formation for the 21st century school

We began this section with an indication: to think about the school as we know it and place it in the current context. Without much effort, we can see that there is a big gap between this space (the school) and the time in which we live (the 21st century). Although it is possible to glimpse movements in favor of 21st century education, when it comes to projects and structural and curricular reforms, there is still no evidence of an effective nationwide change that could characterize a different school, centered on learning, knowledge and integrated with digital culture. Our schools still bear the marks of the 20th century, engaged in the “[...] transmission of culture and knowledge built by humanity to new generations” (Pesce; André, 2012, p. 40). We emphasize that

[...] today's school competes with other cultural agencies such as the mass media and the internet for the transmission of knowledge, intellectual formation and the education of the sensibilities of children and adolescents. And it competes under disadvantageous conditions, since, due to its “hard” characteristics, its structuring grammar, the school is less permeable to these new configurations of fluidity and uncertainty (Dussel, 2009, p. 375).

Within this context, the discourse we adopt in this text is developed under three pillars, namely: i) the rupture with the traditional school of the 20th century; ii) the rupture with the traditional models used in teacher formation; and iii) research as a key instrument for professional teacher development.

We highlight that the traditional models mentioned in this study include the academic and practical perspectives, as well as technical rationality. The academic perspective aims to form for mastery of the content to be taught, with a focus on forming a specialist in one or more areas and disciplines, while the practical perspective assumes formation for experimental and creative knowledge, with a focus on formation in and for practice. Technical rationality, in turn, forms for the ability to act according to the rules and techniques of scientific knowledge, with a focus on formation of a technician capable of acting according to certain techniques (Pérez-Gómez, 1992).

In this way, we understand that a rupture with the traditional school of the 20th century is necessary in order to consolidate the school of the 21st century, focused on integral education² and centered on learning (Nóvoa, 2022). In addition, it is necessary to mobilize changes in teacher formation, leading them towards formation processes aimed at professional teacher development, with a view to professionalizing teachers and intellectualizing them, in order to qualify teaching processes and value teaching (Garcia, 2009).

The intellectualization referred to here goes against the movement of de-intellectualization, which in recent years has fed conservative discourses and neoliberal policies that place teachers in the position of facilitators or mediators of learning, or even as instructors or applicators of didactic materials and assessments prepared by specialists (Nörnberg, 2020).

It is in this scenario that the research process fits in as a “[...] significant resource for teachers’ professional development” (Pesce; André, 2012, p. 39). Studies have shown many possibilities when teacher formation is planned and carried out from a perspective of social reconstruction, with a focus on developing teaching knowledge that leads teachers to be reflexive and to investigate their practice, in other words, to train reflective teachers and teacher-researchers (Diniz-Pereira; Zeichner, 2017; André, 2012). This is how the authors cited propose that teachers should systematize their reflection, making it investigative.

This is why this dialog between the sociological imagination and teacher formation was proposed, with a focus on professional development and scientific thinking. It should be noted that the definitions of scientific thinking used in this study adopt general reasoning, problematization and problem-solving strategies traditionally associated with scientific research processes.

They are called “[...] general reasoning strategies [...]”, because they are not limited to the scientific community and can be explored in different situations and contexts, such as pedagogical practice in everyday school life, for example (Bizzo, 2012).

According to André (2012), the procedures used in research can lead teachers to reflect on their professional practice, as well as to seek to qualify their work by developing knowledge, skills, attitudes and relationships. The author points out that by using the tools inherent in scientific research, teachers are able to critically read their working reality and identify ways of overcoming the difficulties they encounter.

The research process leads the investigator to develop scientific thinking, which is the interrelationship between general strategies and specific knowledge (specific to scientific methodology) (Bizzo, 2012). According to Souza and Santos (2013), scientific methodology aims to awaken the individual’s potential as an elaborator and producer of knowledge, giving him the conditions to effectively expand his ability to develop problematization skills – what it means and how to interact with the world around them. In this way, these strategies of general mastery of reasoning are associated with the production of knowledge based on evidence, comparisons, hypothetical-deductive reasoning, among other resources, which are driven by movements of (re)elaboration of thought, concepts and theories about different phenomena (Faria; Moura Vaz, 2017).

Furman (2009, p. 125), when writing about the foundations of scientific thinking, states that it refers to “educating” natural curiosity, creating “[...] habits of more systematic and autonomous thinking”. This implies: a) encouraging questioning, b) developing possible explanations for what is being observed, c) imagining ways of testing your hypotheses and d) sharing ideas with peers.

In the same segment, it is worth pointing out that scientific thinking, although systematic, also has a creative character, which requires a complex and comprehensive look at what is being observed. For this reason, some studies point to a set of skills that make up this way of thinking, such as observing with a purpose; describing the observation; comparing, classifying and categorizing with criteria; developing questions that can be investigated; proposing predictions (hypotheses); planning the research process; analyzing

results; proposing explanations for the results; proposing models; theorizing the research; arguing based on evidence, among other issues (Souza; Santos, 2013; Bizzo, 2012; Furman, 2009).

According to Nörnberg (2020), will, desire, decision-making and action, as well as scientific-cultural and theoretical-practical formation, are constitutive dimensions of teaching. In addition, we also see other competences listed by scholars who investigate the teacher-researcher: the personal willingness to investigate; the desire to question; adequate formation to formulate problems; the selection of methods and instruments for observation and data analysis; acting in environments favorable to the constitution of research groups; consulting specialized sources and bibliography (Diniz-Pereira; Zeichner, 2017; André, 2012).

It is clear that, when we propose the development of teachers' scientific thinking through sociological imagination exercises in continuing education processes, we are dealing directly with a movement of intellectualization, of social reconstruction, which tends to lead teachers to the place of protagonists, that that they deserve, the place of actor, in which they can exercise their teaching with real autonomy, with effective belonging.

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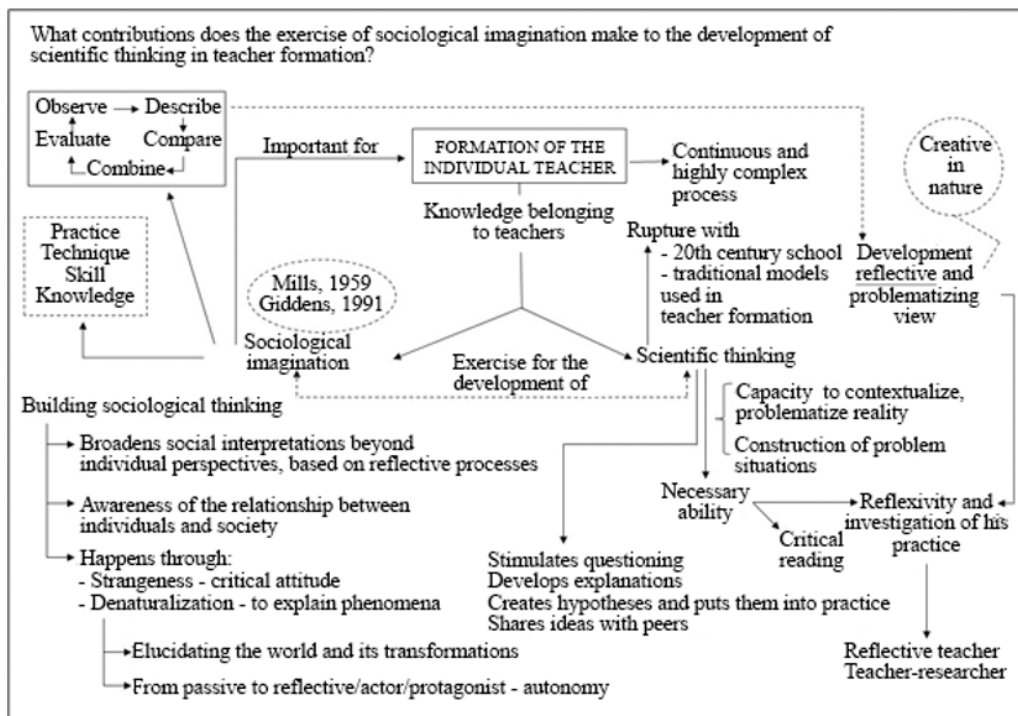
Results and discussions

In fact, teachers go through different stages of development in their formation process. In this study, we present a dialogue between the sociological imagination, the development of scientific thought and teacher formation, highlighting the need for formation aimed at intellectualizing the profession and envisioning the formation of teacher-researchers.

In this context, it is important to emphasize that, when we talk about teacher-researchers, we are not referring to academic researchers, but rather to people with high levels of knowledge and skill, which are not acquired naturally, but need to be developed strategically in formation processes aimed at professional teacher development (Diniz-Pereira; Zeichner, 2017).

For a better relational analysis of the concepts presented in the theoretical framework, we have drawn up a map with the terms covered in this study, shown in figure 1:

Figure 1 – Relational map on sociological imagination and scientific thinking



Source: prepared by the authors (2023).

In this analysis, we interpose sociological imagination and scientific thinking as knowledge belonging to teachers, which can be worked on in initial and/or continuing formation processes to develop reflective teachers and teacher-researchers, based on the ability to carry out a broader reading of social and natural phenomena that can effectively reflect on the adoption of a critical and questioning stance, helping these professionals to leave their position as cultural reproducers and act as protagonists in the construction of knowledge and pedagogical practice.

Both concepts can be treated as a practice, a technique, a skill, and/or even knowledge, as we have mentioned in this study, depending on the context in which they are explored and the epistemology understood and adopted by each author. It's worth pointing out that, regardless of the different understandings that can be given to sociological imagination and scientific

thinking, both induce reflective processes, stimulate a critical attitude, exercise questioning, induce investigation and propose a broadening of the teacher's world view, which tends towards the qualification of their work, towards their intellectualization, in other words, characterizes this professionalization, which is based on the specificities of the profession.

Final considerations

The main objective of this study was to learn about the contributions of the exercise of sociological imagination to the development of scientific thinking in teacher formation. In summary, it is clear from this study that sociological imagination and scientific thinking are intrinsically intertwined. In the research process, the ability to visualize beyond the tangible limits of information is crucial. The intersection between research procedures and the creativity of the sociological imagination allows us to unravel the complexities underlying social phenomena, broadening our understanding of the reality in which we live. Like the sociological imagination, the development of scientific thinking enables human beings to develop an integral and reliable understanding of the observed scenario, taking into account broader historical aspects, through problematization and the construction of new knowledge.

By adopting the sociological perspective, teachers are encouraged to analyze social problems in their complexity, seeking to understand the interactions between individuals, institutions and broader social structures. In this way, the sociological imagination allows us to recognize the social structures that influence our lives, revealing how these structures can be transformed for the benefit of society.

It is clear that one of the great contributions of the sociological imagination is the awareness that we can only understand our existence and analyze our future if we step out of this place as individuals, perceiving ourselves as part of a broader and more complex social context, which adds scientificity to our discourses and leads us to scientific thinking.

Thus, for example, breaking away from this romantic view of teaching would not mean taking away the "beauty" that exists in the processes of teaching and learning, but would imply seeing teaching work in different dimensions, those that are imbricated in the individuality of the person.

Therefore, these dimensions are found in the professional's personality, in the way the educational institution is organized, in the characteristics of economic power and in the social and political model that has manifested itself throughout history. These dimensions magnify the profession, along with the elements that add moral values to the teaching profession, when they are understood within history and are articulated and considered, because they end up showing not only the completeness of the profession, but also its complexity.

Another effective contribution of the sociological imagination to the development of scientific thinking is the potential to awaken in teachers a critical reflection and a plural view of the society in which they live, because this practice presents different perspectives of analysis, broadening their perception of the phenomena observed. The sociological imagination, if practiced in teacher formation, can induce reflexivity and investigation of teaching practice, as it leads to questioning the certainties and uncertainties of contemporary social life.

Proof of this is that simplifying and limiting the role of the teacher to a pretty image of a missionary teacher has caused great damage to the teaching career and has highlighted the need to professionalize teaching and the lack of formation practices that foster the sociological imagination in the exercise of reflection, inquiry and investigation into the various elements that constitute us as individuals, teachers and part of society, in a historical context that fosters the superficiality in which teachers are sometimes placed.

In conclusion, exploring the exercise of sociological imagination emerges as an essential component for improving scientific thinking in the context of teacher formation. The interaction between these two facets proves especially fruitful in providing future educators with a deeper and more comprehensive perspective on the complexities of the social dynamics present in classrooms and society in general. By applying the sociological imagination to the process of research and analysis, teachers in formation not only expand their capacity for inquiry, but also develop the ability to consider varied contexts and plural perspectives when addressing pedagogical and social issues.

Notas

1. It is worth noting that “Mundo das Mensagens (World of Messages)” is a site that is widely used for producing and publishing messages on different topics, as well as for consulting information, since when you type “to be a teacher is...” into the Google search box, it is the first site option that appears, which indicates the high frequency of its algorithms in terms of public utility. Available at: <https://www.mundodasmensagens.com/>. Accessed on: Jan. 17, 2023.
2. This study uses the term “integral education” from the perspective of the National Common Curriculum Base, which guides the structuring of curricula in Brazil. This document understands that education must guarantee the full development of the human being in all its dimensions: intellectual, physical, emotional, social and cultural (Brasil, 2018).

Referencias

ANDRÉ, Marli Eliza Dalmazo Afonso de (org.). **O papel da pesquisa na formação e na prática dos professores**. Campinas: Papirus, 2012.

ANDRÉ, Marli. **Práticas inovadoras na formação de professores**. Campinas: Papirus, 2016.

BIZZO, Nélio. **Pensamento científico**. São Paulo: Melhoramentos, 2012.

BRASIL. **Base Nacional Comum Curricular**. Ensino médio. Brasília: MEC, 2018. Disponível em: http://basenacionalcomum.mec.gov.br/wp-content/uploads/2018/04/BNCC_EnsinoMedio_embaixa_site.pdf. Acesso em: 17 jan. 2023.

DEMO, Pedro. **Metodologia da investigação em educação**. Campo Largo: Ibpex, 2005.

DINIZ-PEREIRA, Júlio Emílio; ZEICHNER, Kenneth M. **A pesquisa na formação e no trabalho docente**. São Paulo: Autêntica, 2017.

DUSSEL, Inés. A transmissão cultural assediada: metamorfoses da cultura comum na escola. **Caderno de Pesquisa**, São Paulo, v. 39, n. 137, p. 351-365, maio/ago. 2009. Disponível em: <https://www.scielo.br/j/cp/a/SRvPrGHbRpbbldCHFLSTXj/abstract/?lang=pt>. Acesso em: 17 jan. 2023.

FARIA, Alexandre Fagundes; MOURA VAZ, Arnaldo de. Pensamento científico empregado em tarefas de Física Básica. **Investigações em Ensino de Ciências**, Porto Alegre, v. 22, n. 1, 2017. Disponível em: <https://ienci.if.ufrgs.br/index.php/ienci/article/view/548>. Acesso em: 17 jan. 2023.

FURMAN, Melina. **O ensino de ciências no ensino fundamental**: colocando as pedras fundacionais do pensamento científico. São Paulo: Sangari Brasil, 2009.

GIDDENS, Anthony. **As consequências da modernidade**. São Paulo: Editora Unesp, 1991.

LIMA, Telma Cristiane Sasso de; MIOTO, Regina Célia Tamaso. Procedimentos metodológicos na construção do conhecimento científico: a pesquisa bibliográfica. **Revista Katálysis**, Florianópolis, v. 10, p. 37-45, 2007.

GARCIA, Carlos Marcelo. Desenvolvimento profissional docente: passado e futuro. **Revista de Ciências da Educação**, Lisboa, n. 8, p. 7-22, 2009. Disponível em: <http://sisifo.ie.ulisboa.pt/index.php/sisifo/article/view/130>. Acesso em: 17 jan. 2023.

MILLS, Charles Wright. A promessa. In: MILLS, Charles Wright **A imaginação sociológica**. Rio de Janeiro: Zahar, 1959.

NÖRNBERG, Marta. Políticas conservadoras e (des) intelectualização da docência. **Praxis Educativa**, Ponta Grossa, v. 15, p. 1-14, 2020. Disponível em: <https://revistas.uepg.br/index.php/praxiseducativa/about/contact>. Acesso em: 17 jan. 2023.

NÓVOA, António Manuel Seixas Sampaio da. **Escola e professores**: proteger, transformar, valorizar. Salvador: lat, 2022. Disponível em: <https://rosaurasoligo.files.wordpress.com/2022/02/antonio-novoa-livro-em-versao-digital-fevereiro-2022.pdf>. Acesso em: 8 abr. 2022.

PÉREZ-GÓMEZ, Ángel I. La función y formación del profesor/a en la enseñanza para la comprensión. Diferentes perspectivas. In: GÓMEZ, Ángel I. Pérez. **Comprender y transformar la enseñanza**. Editora Morata, 1992.

PESCE, Marly Krüger de; ANDRÉ, Marli Elisa Dalmazo Afonso de. Formação do professor pesquisador na perspectiva do professor formador. Formação Docente: **Revista Brasileira de Pesquisa sobre Formação de Professores**, Belo Horizonte, v. 4, n. 7, p. 39-50, 2012. Disponível em: <https://www.revformacaodocente.com.br/index.php/rbpf/article/view/62>. Acesso em: 17 jan. 2023.

PIZZANI, Luciana; SILVA, Rosemary Cristina da; BELLO, Suzelei Faria; HAYASH, Maria Cristina Piumbato Innocentini. A arte da pesquisa bibliográfica na busca do conhecimento. **RDBCi**: Revista Digital de Biblioteconomia e Ciência da Informação, Campinas, v. 10, n. 2, p. 53-66, jul./dez, 2012. Disponível em: <https://periodicos.sbu.unicamp.br/ojs/index.php/rdbci/article/view/1896>. Acesso em: 17 jan. 2023.

SOUZA, Girlene Santos de; SANTOS, Anacleto Ranulfo dos; DIAS, Viviane Borges.

Metodologia da pesquisa científica: a construção do conhecimento e do pensamento científico no processo de aprendizagem. Porto Alegre: Animal, 2013.

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