RESEARCH IN MATHEMATICAL EDUCATION WITH QUALITATIVE APPROACH: possibilities for teacher professional development

Iracema Campos Cusati[1]
Neide Elisa Portes dos Santos[2]
Raphael Campos Cusati[3]

ABSTRACT: This essay presents an analysis of the qualitative methodology used in research in Education, and particularly in Mathematics Education, from perspectives focused on research in Teacher Training, Work and Teacher Professional Development. The theoretical contribution that underlies this article is guided by the investigations by Marli André, Bernadete Gatti, Dalila Andrade, Lee Shulman, João Pedro da Ponte and Carlos Marcelo Garcia in order to understand the intentionality of the educational matrices that permeate the theme in the intricate interaction subject/object. In the analysis developed, based on a bibliographic review of a qualitative nature, the articulation between the highlighted lines of investigation: teacher training, teaching work and professional development of teaching, is configured by processes that are intertwined in the trajectory of teacher professionalization, which is conceived as a means of constructing the identity of teachers. Professional development considers not only the intellectual aspect, but also the different ways and languages through which subjects learn and build their identities, their ways of being in the world, in contact with other people, with the environment and with society. Our proposal is to emphasize the relevance of the qualitative approach in research due to the frequent uses, knowing that the spectrum in this research technique is wide due to its high capacity to aggregate knowledge and meanings to the phenomena studied. The established debate encourages researchers, particularly those in the area of Mathematics Education, to face the challenges established by the new educational conditions experienced in contemporary society.

KEYWORDS: Educational research; Teacher training; Professional development of teaching.

RESUMO: Neste ensaio é apresentada uma análise da metodologia qualitativa empregada nas pesquisas em Educação, e particularmente, em Educação Matemática, a partir de perspectivas voltadas à investigação em Formação de Professores, Trabalho e Desenvolvimento Profissional Docente. O aporte teórico que subjaz este artigo é norteado pelas investigações de Marli André, Bernadete Gatti, Dalila Andrade, Lee Shulman, João

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[1] Doutora em Educação pela Faculdade de Educação da USP (FEUSP). Professora Permanente do Programa de Pós-Graduação em Formação de Professores e Práticas Interdisciplinares (PPGFPPI)/UPE Campus Petrolina. Rodovia BR 203, Km 2, s/n. Vila Eduardo. CEP: 56.328-903 – Petrolina – PE. Telefone: (87) 9 9826-4879. E-mail: iracema.cusati@upe.br
[2] Doutora em Educação (UFMG), Professora adjunta da Faculdade de Educação (FaE) da Universidade do Estado de Minas Gerais (UEMG). Prudente de Morais, 444. Cidade Jardim. CEP: 30.380-002 – Belo Horizonte – MG. Telefone: (31) 3239-5900. E-mail: neide.santos@uemg.br
[3] Doutor em Agroquímica (UFV), Professor adjunto da Faculdade de Viçosa (FDV) e da Universidade do Estado de Minas Gerais (UEMG). Av. Olegário Maciel, 1427. Bairro Industrial. CEP: 36.500-000 – Ubá – MG. Telefone: (32) 3532-2459. E-mail: raphaelcusati@yahoo.com.br

Pedro da Ponte e Carlos Marcelo Garcia com o intuito de compreender a intencionalidade das matrizes educativas que permeiam o tema na intrincada interação sujeito/objeto. A partir de uma revisão bibliográfica de natureza qualitativa, é analisada a articulação entre as linhas de investigação: formação de professores, trabalho e desenvolvimento profissional docente, por configurarem em processos que se entrelaçam na trajetória de profissionalização docente que é concebida como um meio de construção da identidade de professoras e professores. O desenvolvimento profissional considera não apenas o aspecto intelectual, mas também as diferentes formas e linguagens pelas quais os sujeitos aprendem e constroem suas identidades, seus modos de ser e estar no mundo, no contato com outras pessoas, com o meio ambiente e com a sociedade. Nossa proposta é dar ênfase a abordagem qualitativa nas pesquisas em função dos usos frequentes, cientes de que o espectro das suas técnicas é amplo devido a capacidade de agregar conhecimentos e sentidos aos fenômenos estudados. O debate instituído incita os pesquisadores, particularmente os da área de Educação Matemática, para enfrentarem os desafios estabelecidos pelas novas condições educacionais vividas na sociedade contemporânea.

PALAVRAS-CHAVE: Pesquisa educacional; Formação de professores; Desenvolvimento profissional da docência.

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INTRODUCTORY CONSIDERATIONS

Research, according to the perspectives assumed by the researcher, can mean the search for understanding and significant interpretation from the formulated question, or the search for a convincing explanation about a question.

The use of the qualitative approach in research in the Humanities and Social Sciences is not recent, since it began in the United States of America, in the 19th century, when aspects related to daily life began to be an object of study. At that time, the basis of social investigation focused on studying human beings and their culture from a dynamic relationship between the researcher and the investigation context. The theoretical contribution that guides this text is constituted from the authors whose productions are focused on qualitative research in an intricate subject/object interaction. Thus, our proposal is to emphasize the relevance of the qualitative approach in research due to its frequent uses, knowing that the spectrum of qualitative research techniques is wide due to its high capacity to aggregate knowledge and meanings to the studied phenomena that allow dimension a *corpus* to the research questions.

Our understanding is that studies on training and teaching work, as inseparable elements, can contribute to the unveiling of certain phenomena or objects of investigation that, based on a qualitative perspective, allow us to apprehend and understand the wishes and expectations of teachers.

The current experiences of teachers, training spaces, learning communities and varied field experiences mobilize general questions that permeate our thoughts and lead our writings supported by an extensive knowledge base that aim to promote the understanding of teacher training (initial and continuing).

It is worth mentioning that qualitative research has become important in Mathematics Education in several lines of research such as: Teacher Training; History of Mathematics; History of Science and Mathematics Teaching; Psychology of Mathematics Education; Didactics of Mathematics, among others.

Thus, in this article, we present, as a product of our investigation, a bibliographical and documentary review about qualitative research in the Human Sciences with the objective of listing some reflections of scholars on the panorama of the development of academic investigations that use the qualitative perspective in the field of Mathematics Education.

Therefore, we emphasize that our investigation is based on the following assumptions: research, as an educational and scientific principle, must permeate the training and pedagogical practice of teachers who work in basic and higher education; the exploratory and subjective character crosses qualitative research, and teacher training takes place throughout life. Therefore, theoretical studies must reach teachers' knowledge in order to support their practices in the classroom with the purpose of enriching teaching work.

This article is structured as follows: at first, we seek to present our motivation for the study and the historical and philosophical foundations of the qualitative approach to research in Education that underpin the modalities of qualitative research developed, especially in the area of Mathematics Education.

In the following sections, we list some research related to the training (initial and continuing) of teachers and to the teaching work that unfolds for an understanding of the Professional Teacher Development that can support the current debate around the pedagogical practice in Mathematics.

1. The qualitative research approach

The qualitative research approach was and has been the subject of multiple interpretations arising from different conceptions and possibilities of studying the phenomena that involve human beings and the intricate social relationships that are established in different environments.

The historical origin of this approach based on the question whether the method of investigation of the physical and natural sciences should continue to be the model for studying human and social phenomena, together with the foundations of a positivist approach to knowledge, began to drive researchers in favor of a hermeneutic approach concerned with the interpretation of meanings contained in everyday life and their interrelationships.

From this perspective, the focus of investigation centered on understanding the meanings attributed by subjects to their actions within a context and on principles that the qualitative research approach advocates, we assume as a presupposition of this study, that human experience is mediated by interpretation.

Ethnomethodology, the study of how individuals understand and structure their daily lives in the search for a construction of the reality that surrounds them via tacit knowledge, is one of the currents of sociology that influenced the qualitative approach to research.

Very close to symbolic interactionism, which constitutes a theoretical perspective for understanding the way in which social subjects interpret the objects and other people with whom they interact and how such a process of interpretation leads individual behavior in specific situations, developed, in Anthropology, a trend known as ethnography whose central concern is focused on the meanings that actions and events have for the people or groups studied.

Ethnographic research places emphasis on the process, on what is taking place rather than on the product, on the final results. The ethnographer tries to capture and portray the personal vision of the participants and has the task of gradually seeking to approach the ways of understanding the reality of the studied group, sharing with them the meanings elaborated.

Although these conceptions permeated the debates at the end of the 19th century, studies based on this qualitative methodology were sparse until the mid-20th century and in the area of education only in the 1960s they began to appear. According to Bogdan & Biklen (1994), the delay in research with this approach is due to the strong experimentalist

tendency dominated by Psychology. In the following decade (in the 1970s), studies and research with a qualitative approach flourished mainly in the United States and England.

In the 1980s, this approach became popular in Brazilian research in the field of education in the search for translating and expressing the meanings of social phenomena. Nowadays, qualitative research has been used in association with various interpretive techniques that study phenomena related to human beings and their intricate social relationships with the intention of describing and decoding the components of a complex system of meanings that promote the reduction of the distance between theory and practice.

According to Bogdan & Biklen (1994, p. 67), in qualitative research, "the main objective of the researcher is to build knowledge and not give an opinion about a given context". As the authors argue, the expression "qualitative research" is a generic term used to refer to a set of research strategies that have common characteristics such as the ability to "generate theory, description or understanding" (BOGDAN & BIKLEN, 1994, p. 67) that is, it seeks to understand the process through which the interviewed participants construct meanings on the topic to be investigated.

Gatti and André (2011) highlight four important points of qualitative research that characterize a "new connotation":

> i) Deeper understanding of the production processes of school failure, one of the major problems in Brazilian Education, which is now studied from different angles and with multiple approaches; ii) Understanding of educational issues linked to social and sociocognitive prejudices of different natures; iii) Discussion about diversity and equity; and iv) Emphasis on the importance of school and community environments. (Gatti & André, 2011, p. 34).

It should be noted that the option for a qualitative methodological approach in the field of research in Mathematics Education is justified by the fact that this tendency

> [...] answers very particular questions [...] works with a universe of meanings, motives, aspirations, beliefs, values and attitudes, which corresponds to a deeper space of relationships, processes and phenomena that cannot be reduced to the operationalization of variables (Minayo, 1996, p. 21-22).

In light of the aforementioned, it can be said that the movement of reviewing historical moments of qualitative research in the context of Brazilian education helps to reveal the construction of knowledge in the dynamics of understanding humanization processes in school institutions.

In this perspective, Bogdan & Biklen (1994, p. 47-50) present five characteristics of qualitative research, presented here schematically: 1) the direct source of data collection is the natural environment where the phenomena occur, with the investigator being the main instrument. "Qualitative researchers attend study sites because they care about context." (Bogdan & Biklen, 1994, p. 48). The authors argue that actions are better understood when they are observed in the very environment in which they occur. 2) Qualitative research is descriptive because "the data collected are in the form of words or images and not numbers" (Bogdan & Biklen, 1994, p. 48). This data includes interview transcripts, field notes, photographs, videos, personal documents, memos or other records. (Bogdan & Biklen, 1994, p. 48). 3) Qualitative researchers are more interested in the process than simply the results or products (Bogdan & Biklen, 1994, p. 49). The researcher's interest is to verify how a problem manifests itself in some situations. 4) Qualitative researchers tend to analyze data (rather than assumptions) inductively. "They do not collect data or evidence for the purpose of confirming and informing previously constructed hypotheses, rather, abstractions are constructed as the particular data that were collected come together (Bogdan & BIklen, 1994, p. 50). 5) Meaning is vitally important in the qualitative approach. "Researchers using this approach are interested in how different people make sense of their lives." (Bogdan & Biklen, 1994, p. 50).

In the present work, we consider as relevant the potential of the mentioned approach both in investigations on initial and continuing education of teachers in which the problematization of the practice itself is configured as one of the constitutive elements of a conscious teaching action.

Still on the qualitative approach, Bogdan & Biklen (1994) argue, based on Psathas (1973, p. 51) that the role of the researcher in this approach is to question the research subjects in order to perceive "what they experience, the ways in which they interpret their experiences and the way in which they themselves structure the social world in which they live". (Psathas, 1973 *apud* Bogdan & Biklen, 1994, p. 51, authors' emphasis).

The investigations and actions based on a qualitative perspective can bring contributions both to the training and to the teaching practice, especially when the teacher problematizes and investigates their practical proposal. In the field of didactics, this process was discussed by Martins (2002; 2003).

In this scenario, studies on the daily life of the school seem to play an important role. Such studies can be related both to the possibility of reflection on the teacher's own

practice, and to research with a qualitative approach aimed at understanding aspects of the school's daily life.

André (2002), when discussing ethnographic studies in the educational field, argues that the dimension of the institutional climate acts in the mediation between social praxis and what happens at school. It should be noted that one of the burning issues in teacher education is the articulation between theory and practice. According to the aforementioned author:

> School praxis is determined by broader social praxis through pressures and forces arising from educational policy, from top-down curricular guidelines, from parents' demands, which interfere with school dynamics and confront the entire social movement of the institution. The school results, therefore, from this clash of various social forces. (André, 2002, p. 40).

The author also mentions two other dimensions: the interaction in the classroom, which involves the teacher and student's relationship, but is influenced by the school dynamics and the social dimension, and also the history of each subject that manifests themselves daily at school through the forms of social representation through which they guide its actions. In this process, the author highlights the dimension of the individual's subjectivity. These three dimensions, according to André (2002), make it possible to understand the social relationships expressed in everyday school life, in a dialectical man-society approach in the different moments of this relationship.

As it has been discussed, qualitative research is focused on phenomena - what is shown, what is manifested - and not on facts characterized by events, occurrences and objective realities.

The advances that have taken place in the scientific production of qualitative research are configured in different ways both in terms of theoretical foundations and in methodological references about the applicability of technical procedures to investigate the object in the various academic areas in Education, revealing qualitative methods and links established with subjects and investigated problems.

Science unifies the functions of reason and experience in the constitution of scientific knowledge that differs from all other knowledge generated by its methodological rigor.

In qualitative research, methodological rigor is not synonymous with neutrality, even if it safeguards a thorough congruence with the theoretical contributions and technical procedures of scientific investigation. The concept of methodological rigor,

André (2013, p. 96) alerts us: "is not measured by the naming of the type of research, but by the clear and detailed description of the path followed by the researcher to achieve the objectives and by the justification of the options made in this path".

In the scenario of the qualitative approach, the methodological rigor of the research is established by the explanation of the steps followed in carrying it out, that is, the clear and detailed description of the path taken to achieve the objectives, with the justification of each option made in this path. This explanation, in addition to revealing the concern with the scientific rigor of the work (whether or not the necessary precautions were taken in the choice of subjects, in the procedures of data collection and analysis, in the elaboration and validation of the instruments and in the treatment of the data), also reveals the ethics of the researcher, who, when exposing their points of view, gives the reader the opportunity to judge their attitudes and values.

Lüdke and André (2013) guide that the choice of methodology is determined by the nature of the problem. Thus, for the complex reality that characterizes the school to be studied with scientific rigor, subsidies must be sought in the qualitative approach of research, since this type of investigation and its ability to understand school-related phenomena offers essential tools for the interpretation of educational issues.

Research, for Pierre Bourdieu (2004) "[...] is too serious and too difficult a thing to be able to take the liberty of confusing rigidity, which is the opposite of intelligence and invention, with rigor [...]" (Bourdieu, 2004, p.26).

The austerity promoted by the dichotomy between quantitative research versus qualitative research, if not properly managed, can induce the researcher to assume a sectarian posture in relation to the methodological options of each one of them. It would be reasonable to combine both, allowing subsidizing in the unveiling of certain phenomena or objects of investigation. However, the scholar warns about the need to discuss the aspects that generate controversy between qualitative and quantitative research, emphasizing that it is essential to choose the methodological approach that the researcher makes in line with the objective of approaching reality.

According to Minayo (1996, p. 239):

> Neither [approaches], however, is good, in the sense of being sufficient for a complete understanding of this reality. A good method will always be the one that, allowing a correct construction of the data, helps to reflect on the dynamics of the theory. Therefore, in addition to being appropriate to the object of investigation and offering theoretical elements for the analysis, the method must be operationally feasible.

It is up to the researcher, therefore, the continuous effort to overcome this polemic and rescue a dialectical vision between these two traditions of social research.

The following section is intended to explain qualitative investigations aimed at teacher training and the professional development of teachers, relevant topics among those considered essential in issues related to the school context.

2. Links established between Teacher Training, Teaching Work and Professional Development of Teaching

The educational action necessarily becomes a social praxis and, in this sense, the teaching work does not disregard the production relations in which it is inserted and how these relations interfere in the nature of the educational work. In this sense, it is necessary to understand the constitutive links of this reality and, for these reasons, the qualitative approach research stands out with its subjective character in relation to the object of analysis.

From the assumption that there is an inseparability between training and teaching work, we can say that, as the school organization[4] acquires new contours outlined by public policies aimed at educational reform, focusing on the curriculum, assessment and management, the more complex the teaching job becomes. This is because the Curriculum Guidelines aimed at the training of education professionals attribute to education professionals, based on the assumptions of democratic management, the prerogative of participating in the elaboration of the school's pedagogical proposal, as well as participation in the institution's decision-making processes.

In this sense, teacher training has become a strategic element. However, it is necessary to problematize the different conceptions of training, especially that of continuing education, because, as Souza (2006) recalls, the argument of teacher incompetence ends up supporting reductionist conceptions and practices of continuing education.

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[4] The term school organization in this text is used in the sense proposed by Oliveira et al. (2012, p. 54) as a notion that encompasses [...] "the objective conditions under which teaching is structured," that is, "from the administrative competences of each government agency to the curriculum that is practiced in the classroom class, passing through the teaching methodologies and evaluation processes adopted, all this would be a matter of school organization."

The aforementioned author brings some reflections about the ethnographic approach in education based on the studies of Patto (2015) who carried out a comprehensive literature review to problematize the issue of teacher training.

Souza (2006), based on an analysis of the literature and the reality of São Paulo, identifies the improvement of the quality of education as the founding argument of the propositions about continuing education. The author problematizes the unfolding of the work of Guiomar Namo de Mello published in the 1980s based on two categories: technical competence and political commitment. According to Souza (2006), Mello's work ended up, even unintentionally, contributing to the construction of a negative view of teachers, resulting in a simplistic view based on the teacher's incompetence, being part of a "hegemonic academic discourse and educational policies" (Souza, 2006, p. 484)

According to the author:

> [...] our analyzes indicate that the recent proposals for the continuous training of educators, developed by the SE, have taken teachers individually and isolated from their work context, considering the poorly qualified professionals who need to be better trained. Schools, their social and institutional contexts, as well as the concrete teaching conditions that each specific school offers, have not been considered as important elements that provide the fabric for the process of change that teachers are expected to go through. (Souza, 2006, p. 488)

In line with the discussions by Souza (2006), we consider that research on education is important, as are comprehensive public policies that overcome the reductionist vision that names the non-competence of teachers. Well, we cannot forget that there is a tendency in the field of public policies today to make the teacher and the school manager responsible for the educational results without considering the objective conditions under which the teaching work is developed. (Oliveira, Fraga; Augusto, 2014)

It is true that ethnographic studies that seek to apprehend and understand the daily life of the school are important, mainly to subsidize the construction of public policies based on real demands, whether focused on training or teaching work. Since, based on the inseparability of training and teaching work, continuous training strategies added to the improvement of working conditions can contribute to a teaching practice towards a critical and reflective performance, enabling an improvement in the social qualification of work and teacher training, valuing the work of the teacher and also improving the social quality of the education of the student.

In this way, researching the professional development of teachers goes beyond the analysis of the knowledge that they acquire throughout their professional teaching life. It

implies considering the autonomous subjects and protagonists with desires, intentions, utopias, etc., under conditioning from historical, cultural, political and social contexts in which they are inserted (González Pérez, 2015). Therefore, it is a topic that, in order to be researched, brings up human relations and the questioning of the world, which involves school practices and institutional knowledge, requires questioning public policies and relating them to the time in force, with the people involved and with the researcher. That is, a matter of relationship with the world, with school practices, with institutional knowledge, with public policies, with our time, with others and with oneself.

It is also necessary to consider the practical experiences, built over the years of work in teaching, as they are also an important factor to consider because it means recognizing teachers as producers of knowledge, as they are often excluded from this process of reflection on the practice itself.

The professional development of teachers, according to Imbernón (2011), refers to several areas in which their actions are manifested, the projects they wish to undertake and the way they plan to execute them. Still, as the scholar defends, this development seeks to promote changes in the work actions of teachers, leading to professional and personal growth.

The sociocultural context strongly influences the teacher's professional development as it is an individual and collective process that takes place in the educational institution, although it is not solely due to pedagogical development, but also involves knowledge and understanding of oneself, cognitive development, theoretical development and everything that encompasses a work situation that allows or prevents the teacher from progressing in their professional life (Imbernón, 2011, p. 3).

For Marcelo Garcia (2009), investing in a teaching career contributes to the growth of teachers as professionals and in their individuality, by providing an improvement in the teaching and learning process that reverberates in the improvement of educational quality.

Finally, it is important to point out that continuing education, from a perspective of professional teacher development, requires time, experimentation and maturation, aspects that are not consistent with school proposals that are decontextualized from the current reality.

Having presented some discussions about the qualitative approach in research in Human and Social Sciences, in the next section we will make some reflections about this approach in the field of Mathematics Education.

3. Teaching learning: the contributions of the theory and practice binomial

In this topic we present our reflections on teaching learning, that is, how the subjects learned to be teachers and understood that teaching is surrounded by different feelings at different moments of professionalization, from a beginning surrounded by fears and attempts to a period of stabilization marked by the desire to learn and the desire to get it right in relation to the path to be followed in the exercise of consolidating the teaching career. Mizukami (2004, 2006) and Shulman (2014) highlight the importance of teaching pedagogical knowledge that must be mobilized in the way of teaching learning.

Teacher training must be related to the practice of the teaching professional, a systematic and scientific activity, which, in a movement of constant dialogue, aims, therefore, to qualify and improve the professional development of the teacher.

We understand that teaching learning should promote moments of reflection for an awareness of pedagogical praxis vis a vis a reflective educational planning in which teacher training is considered the basis of research in the educational field. The pedagogical praxis that we defend involves the "understanding of the inseparability of theory and practice". (Pimenta, 2011, p. 86) Thus, according to the author, "praxis is the practical human theoretical attitude of transforming nature and society". (Pimenta, 2011, p. 86), that is, a continuous and simultaneous process between thinking and acting. Therefore, practice and theory are dependent and correspond to a unity of knowledge, as the teacher is committed to mediating reflective and constructive learning in educational formative moments.

Lee Shulman proposed in the mid-1980s a base composed of categories of teaching knowledge of different natures, but all of which are indispensable and necessary for competent professional performance. According to Shulman (1986, 1987), the knowledge base refers to a professional repertoire that contains categories of knowledge that underlie teachers' understanding that promote student learning. In his investigations dating back to 1996, he proposed to study teaching cases as promising tools in teacher training processes in the face of their teaching learning, using them "as lenses to think about their own work in the future". (Shulman, 1996, p. 199)

> Case knowledge is knowledge of specific, well-documented, and richly described events. Regardless of whether cases are reports of events or sequences of events, the knowledge they represent is what makes them

> cases. Cases can be examples of specific instances of practice – detailed descriptions of how an instructional event took place – completed with particular contexts, thoughts and feelings. On the other hand, they can be examples of principles, exemplifying in their details a more abstract proposition or a theoretical requirement. (Shulman, 1986, p. 11)

In short, teaching cases play an important role when they are used to exchange, organize and generalize experiences, whether through discourse or professional memory.

4. Teacher Professional Development as a trend in Mathematics Education

According to Ponte (1998), the concept of Teacher Professional Development emerged in the educational literature to demarcate a differentiation with the traditional, and not continuous, process of teacher training. The idea of training is related to courses and training in which the trainer carries out an action that is assumed to be necessary and expected by the institutions for the performance of professionals.

Professional development refers to the transformation movement of teachers within a specific professional field, in this case, that of Mathematics. From this perspective, a process of becoming over time or from a formative action. André (2011), when considering studies on teacher training, cites Nóvoa (2009), Imbernón (2011) and Marcelo Garcia (2009) as authors who prefer the term development to characterize evolution and continuity, breaking with the dichotomous view of initial and continuing training. One of the aspects that stimulate the professional development of teachers is the search for a professional identity that allows the teacher to define themselves and the others (Marcelo Garcia, 2009). Identity is the feeling of belonging that portrays the image of the teacher. Professional identity is characterized by the importance that teachers give to their image in the face of the profession. In this sense, the interpretation that teachers have of themselves in the context in which they live in the search for a sense of identity and belonging throughout their teaching career is relevant.

Professional development is built from entering school, as a student, and lasts a lifetime, with attempts and advances. In addition to being a continuous process that extends throughout the working life, from initial training to graduate studies, it undergoes permanent updates and improvements in service.

The analysis of professional development is one of the methodological assumptions of a qualitative investigation that, in the conception of Lüdke and André (2013, p. 13), "implies the collection of descriptive data, obtained by the researcher's

direct contact with the situation studied, emphasizes more the process rather than the product and is concerned with portraying the perspective of the participants".

The professional training of educators, particularly mathematicians, and the way they act are intrinsically related. Professional development is composed of knowledge, considered fundamental, but not sufficient because it is necessary to know how to do and know how to be, which are manifested in the form of knowledge or professional skills.

The problematized and shared practice of the mathematics teacher acquires connotations of professional development when it is configured by the partnership between university and school, as opposed to individual initiatives by the teacher, school or university trainer who assume a colonial perspective on school practices and the teaching profession.

Therefore, professional development needs new work systems and new learning in favor of better qualification and teaching autonomy that is only acquired through a personal, social and political construction that takes place through the interaction of different subjects in the school system in a democratic process. It also depends on educational management that is the result of a collective process of planning, organization and development of a political-pedagogical project that expresses a new paradigm for education.

5. The research developed in the context of Lesson Study: possibilities for the professional development of the Mathematics teacher.

The term "Jyugyo Kenkyu" as it is known in Japan, or "Lesson Study" as it is known in the United States, or "Estudos de Aula/Estudos de Lição" as it was translated in Portugal, or "Estudio de Clases" as it was disseminated in Spain, or "Pesquisa de Aula/Estudo e Planejamento de Lições" as it is used in Brazil, originated in Japan in the late 19th and early 20th centuries and remained forgotten for almost a century.

Lesson Study is a methodology that has as the centerpiece of its process a stage called Research Lesson, that is, a real class where a teacher teaches their students considering certain characteristics that distinguish it from other everyday classes: (i) is observed by other teachers; (ii) is carefully planned in collaboration with other teachers; (iii) has particular objectives to be achieved; (iv) is recorded; (v) is discussed in a post-class time. The centrality of Lesson Study, however, does not diminish the value of other constituent elements of Lesson Study.

The research developed in the context of the Lesson Study promotes three practices considered to enhance professional development: reflective practices, collaborative practices and investigative practices. In this sense, we seek to elucidate teachers' learning in the context of Lesson Study, as we have as a premise that "teachers learn and develop through participation in different practices, processes and contexts, intentional or not, that promote the formation or improvement of teaching practice" (Fiorentini; Crecci, 2013, p. 13).

Mizukami (2013) highlighted that schools are privileged places to trigger processes of development and construction of professional knowledge of teaching. But, for this, we defend that schools and public policies must promote collective work aiming to trigger collaborative exchanges and investigative attitudes, as we consider that the construction of the teacher's professional identity transcends their initial training.

According to Ponte (1997), the teacher should be the protagonist of their continuing education, for deciding what they want to do and what they want to participate in. Ponte (1998) emphasizes the favoring of Teacher Professional Development (TPD) from collaborative contexts between teachers in schools, as it provides interactions with peers, the exchange of experiences and the support of managers. The author lists several fundamental aspects for the TPD, emphasizing that it "makes teachers more apt to conduct the teaching of mathematics adapted to the needs and interests of each student and to contribute to the improvement of educational institutions, fulfilling themselves personally and professionally". (p.32) It is understood as a teaching evolution, which begins in the teacher's initial training and continues throughout the professional life and which involves personal development, professionalization and teacher socialization.

CONCLUSION

From this bibliographic study based on different sources that address reflections on methodological issues of qualitative research, it is shown that Brazilian educational thought was historically permeated by epistemological and methodological thematic convergences and divergences.

Academic research with a qualitative approach is carried out when the study objective is to understand the reason for certain events, phenomena, behaviors or trends.

The use of the qualitative method generated several contributions to the dynamics and structure of the educational process by reconfiguring the understanding of learning and of internal and external relationships in educational instances, with a flexible

qualitative approach without departing from methodological rigor. This demonstrates the existing complexity when researching the social, given that it is necessary to know how to adapt to the context and then extract relevant analyses. For this reason, its foundation is supported by interpretation (hermeneutics) that seeks to understand the meanings of what human beings live, feel, etc.

The reflection carried out throughout this text allowed us to carry out a historical reconstruction of academic research with a qualitative approach to glimpse perspectives of a praxis of conscious investigation through the articulation of teaching knowledge with teaching, research and extension activities.

The debate instituted encourages researchers to face the challenges established by the new educational conditions experienced in contemporary society due to the pandemic of the new Coronavirus. The repercussions in the coming years, post-pandemic, will demand deep questions and responsible actions, with anthropological, philosophical and sanitary references different from the status of the educational tradition.

Presenting the historical characteristics of the qualitative methodology of research in education, its theoretical concepts and main researchers who contribute with reflections in this area can support the establishment of an analytical scientific process of social relations. In particular, with regard to the role of the math educator, we discussed the Lesson Study as a training context, with the potential to promote the teacher's professional development and improve their knowledge.

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