


CHAPTER 101

The theory and practice movement in teaching learning: Lesson Study in the graduation and professionalization of Mathematics teachers

 [10.56238/pacfdnsv1-101](https://doi.org/10.56238/pacfdnsv1-101)

Iracema Campos Cusati

Permanent Professor of the Graduate Programs in Teacher Training and Interdisciplinary Practices (PPGFPI)/UPE Petrolina Campus and Mathematics and Technological Education (EDUMATEC)/UFPE - <http://lattes.cnpq.br/2629444811211201>

Neide Elisa Portes dos Santos

Professor at the Faculty of Education of the University of the State of Minas Gerais - FaE /UEMG – Doctor and Master in Education from UFMG. Pedagogue at the same institution. <http://lattes.cnpq.br/9365847844894061>

Raphael Campos Cusati

Professor at the University of the State of Minas Gerais – UEMG and the Faculty of Viçosa - FDV/MG Doctor and Master in Organic Chemistry from UFV. Pedagogue and Psychopedagogue by UNIFRAN. <http://lattes.cnpq.br/4601529847115186>

Jailson Ferreira da Silva

Master's student in Education at the Teacher Training Program and Interdisciplinary Practices - PPGFPI/UPE Campus Petrolina, Pedagogue at UPE Campus Petrolina. <http://lattes.cnpq.br/0285954413915309>

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 and Teacher Professional Development. The theoretical contribution that underlies this chapter is

guided by the investigations of Marli André, Bernadete Gatti, Dalila Andrade, Lee Shulman and Carlos Marcelo Garcia in order to understand the intentionality of the educational matrices that permeate the theme in the intricate subject/object interaction. In the analysis developed, based on a bibliographic review of a qualitative nature, the articulation between the highlighted lines of investigation: teacher training and teacher professional development, is configured by processes that intertwine in the trajectory of teacher professionalization, which is conceived as a means of constructing the identity of teachers and professors. 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. . In this sense, our proposal is to emphasize the relevance of the qualitative approach in research due to the frequent uses, having the knowledge that the spectrum of qualitative research techniques is wide due to its high capacity to add 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: Qualitative approach in research; Teacher training; Teacher Professional Development; Lesson Studies Study; Mathematics Education.

1 INTRODUCTION

The theoretical contribution that guides this chapter is constituted by the cast of authors whose productions are focused on qualitative research in an intricate subject/object interaction. In this way, we propose 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 add knowledge and meanings to the studied phenomena that allow dimensioning a *corpus* to the investigation questions.

Our understanding is that studies on teacher education 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 desires 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 aims to promote the understanding of the formation (initial and continuous) of teachers.

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 chapter, we present, as a product of our investigation, a bibliographic and documentary review of 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.

This chapter is structured as follows: at first, we seek to present our motivation for the present 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 region of inquiry of Mathematics Education.

In the following sections, we list some research related to the training (initial and continuing) of teachers that unfolds for an understanding of Teacher Professional Development that can support the current debate around the pedagogical practice in Mathematics. Finally, we bring a reflection on *Lesson Study* (class studies) which, centered on the pillars of professional development and student protagonism, promotes the learning of mathematics among students with the perspective of learning mathematics teaching among teachers.

2 QUALITATIVE RESEARCH APPROACH IN SCHOOL CONTEXTS

The qualitative approach to research in education has been 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 approach to research in education advocates, we assume as a presupposition of this study that human experience is mediated by interpretation .

Very close to symbolic interactionism, which constitutes a theoretical perspective for understanding the way in which social actors interpret the objects and other people with whom they interact and how such a process of interpretation leads individual behavior in specific situations, was 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 or end 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 it was only in the 1960s that 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) A deeper understanding of the processes that produce school failure, one of the major problems in Brazilian Education, which is now being studied from different angles and with multiple approaches;
- ii) Understanding of educational issues linked to social and socio-cognitive prejudices of different natures;
- iii) Discussion on 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 to 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, pp. 21-22).

In light of the foregoing, 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 in a schematic way: 1) the direct source of data collection is the natural environment where the phenomena occur, constituting the researcher 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 with the aim of confirming and informing previously constructed hypotheses, instead, 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 this chapter, we consider 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.

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, emphasis added).

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 his/her 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 inside 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 students relationship, but is influenced by the school dynamics and the social dimension, and also the history of each subject that manifests itself daily at school through the forms of social representation through which it guides 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 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.

In qualitative research, methodological rigor is not synonymous with neutrality, even if it preserves a thorough congruence with the theoretical contributions and technical procedures of scientific investigation. The concept of methodological rigor alerts us to André (2013, p. 96): "it 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), it 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 interpretation. of educational issues.

According to Minayo (1996, p. 239):

Neither [approaches], however, is good in the sense of being enough to fully understand this reality. A good method will always be the one that allows a correct construction of the data, help to reflect on the dynamics of the theory. Therefore, in addition to appropriate to the object of investigation and to offer theoretical elements for analysis, the method has to be operationally feasible.

It is up to the researcher, therefore, the continuous effort to overcome this controversy 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.

3 LINKS ESTABLISHED BETWEEN TEACHER TRAINING AND TEACHER PROFESSIONAL DEVELOPMENT

The educational action necessarily becomes a social praxis and, in this sense, it is necessary to understand the constitutive nexuses of this reality and, for these reasons, the qualitative approach research stands out with its subjective character in relation to the object of analysis.

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.

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 Namó de Mello published in the 1980s based on two categories: technical competence and political commitment. According to Souza

(2006), Mello, even if unintentionally, contributed to the construction of a negative view of teachers, resulting in a simplistic view based on teacher incompetence, being part of a "hegemonic academic discourse and educational policies " (SOUZA, 2006, p. 484).

According to the author:

[...] our analyzes indicate that recent proposals for continuing education for educators, developed by SE, have taken teachers individually and isolated from their work context, considering 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)

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, investigating the professional development of teachers goes far beyond the analysis of the knowledge they acquire throughout their professional teaching life. It implies considering them autonomous subjects and protagonists with desires, intentions, utopias, etc., who suffer the conditioning of the 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 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 take into account the practical experiences, built over the years of work in teaching, as it is 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. 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 professional development of the teacher 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 his 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.

4 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 understanding that teaching is surrounded by different feelings at different moments of professionalization, from the beginning of fears and groping 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 from 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 – complete 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)

Finally, 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 training. and continued.

One of the aspects that stimulate the professional development of teachers is the search for a professional identity that allows teachers to define themselves and 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 groping and advances. In addition to being a continuous process that extends throughout the working life, from initial training to postgraduate 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 is intrinsically related to professional development, which is composed of knowledge, considered fundamental, but not sufficient, as it is necessary to know how to do it and to know how to manifest it in the form of knowledge or skills. professionals.

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. 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 actors in the school system in a democratic process. It also depends on an 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.

In the last topic of this chapter, we bring the studies by Ponte et al (2016) that pointed out a relevant contribution to the training of Mathematics teachers by unraveling the challenges that are posed to the practice of research to understand the potential of the methodology of studies of mathematics. lesson (Lesson Study) as a professional development process for teachers, which focuses on their teaching practice, assuming an eminently reflexive and collaborative.

5 LESSON STUDY AND MATHEMATICS TEACHING

“Classroom studies take place within the school environment and in them teachers play a central role” (PONTE et al., 2016, p. 869).

Preparing teachers to teach Mathematics is not an easy task and the experiences of countries that use the *Lesson concept Study* (class studies) in everyday school life is important so that we can even understand this proposal.

The *Lesson Study* is a process in which teachers come together to plan, observe and reflect together on the technique used in the classroom and the lesson plans they have developed in order to improve student performance. The *Lesson Study* is centered on two pillars: professional development and student protagonism. Therefore, it is an interesting perspective because not only students, teachers also learn.

It is a strategy that engages students so that they are active in their learning and are aware that the process of acquiring knowledge is collaborative, as it is also an opportunity for teachers to learn when they study the teaching process.

Another relevant aspect of *Lesson Study* is the opportunity to discuss ways of professional development, from how to work as a team to learn to teach Mathematics. The *Lesson Study* originated in Japan and is understood as a training process in which teachers learn in practice and have the opportunity to reflect, analyze, discuss and plan their classes, focusing on student learning. The main characteristics are

reflection and collaboration, processes that lead teachers to analyze their practices, through work among peers.

In this topic, we bring a discussion about *Lesson Study* in Mathematics Teaching with the assumption that it is a methodological proposal that can be adapted to the Brazilian reality, based on experiences carried out in other countries.

The training of teachers who teach Mathematics using the *Lesson methodology study* it is enhanced by elements that we consider essential, such as: i) the constitution and consolidation of collaborative groups; ii) research into the practice itself; iii) individual and collective reflection of didactic actions; and iv) the appropriation and use of curricular guidelines.

A fundamental aspect of classroom studies is that they focus on student learning and not on the work of teachers, which makes a direct distinction with other training processes. involving observation of classes, but which are primarily focused on the performance of teachers. In this way, the participation of teachers in class studies conducive to collaborative environments promotes learning “of important issues in relation to the content they teach, the curricular guidelines, the reasoning processes and the difficulties of the students and the classroom dynamics” (PONTE et al, 2016, p. 870).

Therefore, class studies consolidate training processes strongly linked to teaching practice, enabling theoretical deepening in several domains - mathematics, didactics, curricular, educational and organizational.

5 BY WAY OF 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 that contribute with reflections in this area can support the establishment of an analytical scientific process of social relations, especially with regard to the role of the math educator.

REFERENCES

- ANDRÉ, Marli Eliza Dalmazo Afonso de. What is a qualitative case study in education? **FAEEBA Magazine - Education and Contemporaneity** , v. 22, no. 40, p. 95-103, Jul./Dec. 2013.
- ANDRÉ, Marli Eliza Dalmazo Afonso de. Research on Teacher Training: Tensions and Perspectives in the Field. IN: FONTOURA, H.; SILVA, M. (Org.). **Teacher Training, Cultures** – Challenges to Graduate Studies in Education in its multiple dimensions. Rio de Janeiro: ANPED, 2011, v. 2, p. 24-36.
- ANDRÉ, Marli Eliza Dalmazo Afonso de . Questions about the aims and methods of research in Education. **Electronic Education Magazine** . São Carlos, SP: UFSCar, v. 1, no. 1, p. 119-131, Sept. 2007. Available at: <<http://www.reveduc.ufscar.br>>. Accessed July 12, 2022.
- ANDRÉ, Marli Eliza Dalmazo Afonso de . Research in everyday school life. In: FAZENDA, Ivani. (Org.). **Educational research methodology**. 8th Ed. Sao Paulo: Cortez, 2002.
- BOGDAN, Roberto C.; BIKLEN, Knopp Sari . **Qualitative research in education: an introduction to theory and methods**. Portugal: Porto Editora, 1994, 336p.
- GATTI, Bernadete Angelina; ANDRE, Marli. The relevance of qualitative research methods in education in Brazil. In: WELLER, W.; PFAFF, N. (Orgs .). **Qualitative research methodologies in Education** : theory and practice. 2nd ed. Petrópolis : Voices , 2011. p. 29-38.
- GONZÁLEZ PEREZ, Teresa. **Educational reforms and teacher training**. Madrid: New Library, 2015.
- IMBERNON, Francisco. A new professional development of the teacher for a new education . **Journal of Human Sciences** . V.12, no. 19, p. 75-86, 2011. Available at: <<http://revistas.fw.uri.br/index.php/revistadech/article/view/343>>. Accessed June 23, 2022.
- LÜDKE, Menga. ANDR É, Marli EDA **Research in education** : qualitative approaches. 2nd ed. Rio de Janeiro: EPU, 2013.
- MARCELO GARCIA, Carlos. **Teacher professional development: past and future**. Journal of Education Sciences. Lisbon, no. 8, p. 7-22, Jan./Apr. 2009
- MARTINS, Pura Lucia Oliver. **Theoretical/practical didactics** : beyond confrontation. 7th Ed. Sao Paulo, SP: Loyola, 2002.
- MARTINS, Pura Lucia Oliver. The relationship between theory and practice in the training of university professors: principles and methodology. **Educational Dialogue Magazine**, vol. 4, no. 10, Sep-Dec, 2003, p. 1-12.
- MINAYO, Maria Cecília de Souza. (org.). **Social Research** : Theory, method and creativity. 5th ed. Petrópolis: Voices, 1996.
- NEW, Antonio. **Teachers** : images of the present future. Lisbon: Educa, 2009.
- PATTO , Maria Helena Souza. **The production of school failure** : stories of submission and rebellion. 4th ed. São Paulo: Casa do Psicólogo, 2015.
- PIMENTA, Selma Garrido. **The internship in teacher education: theory and practice unit**. 10th ed. Sao Paulo: Cortez, 2011.

PONTE, João Pedro et al. Lesson Study as a Professional Development Process of Mathematics Teachers . **Bolema** , Rio Claro (SP), v. 30, no. 56, p. 868 - 891 , Dec. 2016

PSATHAS, George. **Phenomenological Sociology : Issues and Applications** . New York: Wiley, 1973.

SHULMAN, Lee. Just in case: reflections on learning from experience. In COLBERT, J.; TRIMBLE, K.; DESBERG, P. (Eds.) **The case for Education**. Needham Height: Allyn Bacon, 1996, p. 197 - 217.

SHULMAN, Lee. Knowledge and teaching: foundations of the new reform. **Harvard Educational Review** , 57(1), 1987, p. 1-22.

SHULMAN, Lee. Those who understand: knowledge growth in teaching. **Educational Researcher** , 15(2), 1986, p. 4-14.

SOUZA, Denise Trento Rebello de. Continuing teacher education and school failure: problematizing the argument of incompetence. **Education and Research Magazine** , Vol. 32, no. 3, Sept./Dec. Faculty of Education of the University of São Paulo - SP, 2006, p. 477-492. Available at: < <http://www.redalyc.org/articulo.oa?id=29832304> >. Accessed August 30, 2022.