

**Contextualized education in the teaching of Mathematics: a case study at the
Kindergarten and Elementary School Manoel Rodrigues do Nascimento**
**Educação contextualizada no ensino da Matemática: um estudo de caso na Escola de
Ensino Infantil e Fundamental Manoel Rodrigues do Nascimento**
**La educación contextualizada en la enseñanza de las Matemáticas: un estudio de caso en
la Escola de Ensino Infantil y Fundamental Manoel Rodrigues do Nascimento**

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Abstract

Teaching mathematics as a concept formation process requires rethinking the teacher's role, the conditions for organizing pedagogical work, the way of thinking, feeling and acting in education, the characteristics and interests of students. It needs the entire school community's involvement, presenting the content in a contextualized way, through a problematic situation,

compatible with a real situation, which has elements that give meaning and construction to the mathematical content. This work sought to broaden the understanding of contextualization in the teaching of mathematics since working with content that is not related to the context in which the student is inserted is not attractive. To this end, a survey was conducted based on a semi-structured interview with the teachers and students of that school, in addition to observations and pedagogical practice. According to the results, the teachers' conceptions are identified and perceived, showing that the methodologies used by them in a contextualized way provide meaningful learning, since teaching is an active, evolving process about contextualization and its contribution to the learning of the students of this school, the research also shows how the contextualized teaching of mathematics is evaluated and the importance of bringing innovative, motivating and meaningful situations to classrooms. Therefore, it is understood that Contextualized Education in the teaching of mathematics enables the construction of the student's knowledge according to his reality, mainly due to the applicability of Mathematics, stimulates creativity, investigation, critical analysis of results and contributes significantly to the teaching-learning process.

Keywords: Pedagogical practice; Teaching-learning; Contextualization; Mathematics teaching.

Resumo

Ensinar matemática como um processo de formação de conceitos exige repensar o papel do professor, as condições de organização do trabalho pedagógico, a maneira de pensar, de sentir e de agir em educação, as características e o interesse dos alunos. Precisa do envolvimento de toda a comunidade escolar, apresentando o conteúdo de forma contextualizada, por meio de uma situação problematizadora, compatível com uma situação real, que possua elementos que dêem significado e construção ao conteúdo matemático. O referido trabalho buscou ampliar a compreensão acerca da contribuição da contextualização no ensino da Matemática, visto que trabalhar um conteúdo que não se relaciona com o contexto onde o aluno está inserido, não é atrativo. Para isso foi realizado uma pesquisa a partir de entrevista semiestruturada com os professores e alunos da referida escola, além de observações e prática pedagógicas. De acordo com os resultados, identifica-se e percebe-se as concepções dos professores, evidenciam que as metodologias utilizadas por eles de forma contextualizada, proporcionam uma aprendizagem significativa, pois o ensino é um processo ativo, em evolução, acerca da contextualização e sua contribuição para a aprendizagem dos alunos desta escola, a pesquisa ainda traz a forma de como é avaliado o ensino contextualizado da Matemática e a

importância em trazer para as salas de aula situações inovadoras, motivadoras e significativas. Logo, compreende-se que a Educação Contextualizada no ensino da Matemática possibilita a construção do conhecimento do aluno de acordo com sua realidade, principalmente devido à aplicabilidade da Matemática, estimula a criatividade, a investigação, a análise crítica de resultados e contribui de maneira essencial para o processo de ensino-aprendizagem.

Palavras-chave: Prática pedagógica; Ensino-Aprendizagem; Contextualização; Ensino da Matemática.

Resumen

La enseñanza de las matemáticas como proceso de formación de conceptos requiere repensar el rol del docente, las condiciones para la organización del trabajo pedagógico, la forma de pensar, sentir y actuar en la educación, las características e intereses de los estudiantes. Se necesita la implicación de toda la comunidad escolar, presentando el contenido de forma contextualizada, a través de una situación problemática, compatible con una situación real, que tiene elementos que dan sentido y construcción al contenido matemático. Este trabajo buscó ampliar la comprensión sobre el aporte de la contextualización en la enseñanza de las Matemáticas, ya que trabajar con contenidos que no se relacionan con el contexto en el que se inserta el alumno, no resulta atractivo. Para ello, se realizó una encuesta a partir de una entrevista semiestructurada con los docentes y alumnos de esa escuela, además de observaciones y práctica pedagógica. De acuerdo con los resultados, se identifican y perciben las concepciones de los docentes, mostrando que las metodologías utilizadas por ellos de manera contextualizada, brindan un aprendizaje significativo, ya que la docencia es un proceso activo y evolutivo sobre la contextualización y su Contribución al aprendizaje de los estudiantes de esta escuela, la investigación también muestra cómo se evalúa la enseñanza contextualizada de las matemáticas y la importancia de llevar situaciones innovadoras, motivadoras y significativas a las aulas. Por tanto, se entiende que la Educación Contextualizada en la enseñanza de las Matemáticas posibilita la construcción del conocimiento del alumno de acuerdo con su realidad, principalmente por la aplicabilidad de las Matemáticas, estimula la creatividad, la investigación, el análisis crítico de resultados y aporta de manera esencial para el proceso de enseñanza-aprendizaje.

Palabras clave: Práctica pedagógica; Enseñanza-Aprendizaje; Contextualización; Enseñanza de las matemáticas.

1. Introduction

Education in Brazil presents many challenges, be it lack of investment, social, cultural, pedagogical. Brazil explains how much education is being relegated to the background in public policies in the country. Access to school does not guarantee learning. Many of these students will develop functional illiteracy throughout their personal and school trajectory. Because of this, traditional and decontextualized teaching does not satisfy effective learning. According to (Souza et al., 2018), Ausubel's theory of significant knowledge is an important theoretical model of how significant learning develops. A methodology that contextualizes teaching can become a way of acquiring meaningful education (Silva et al., 2019).

When adopting a contextualized methodology, the student questions, seeks information and solutions to problems, that is, participates actively in constructing his knowledge. To this end, teachers position themselves as mediators of the learning process, encouraging students to discover and critically reflect on the issues involved, thus establishing horizontal social relationships that differ significantly from the pedagogical practice of traditional schools that are still intensely stiff and verticalized (Andrade & Fernandes, 2016).

Content does not attract the student's attention if it is not associated with a practical context, with a concrete and existing situation. Therefore, it is possible to highlight that contextualization in mathematics teaching, as a movement triggered in a teaching proposal to support the learning process (Reis & Nehring, 2017).

The contextualization of mathematics allows the student to leave the condition of a passive spectator, and in this context, it is important to emphasize that teaching mathematics in isolation from other disciplines in the areas of knowledge without using the exposure of the contents in a contextualized and dynamic way does not contribute to the development integral education of the student (Alves & Cavalcante, 2017).

Students' interests differ due to the reality they live in since communities come together according to their needs and lifestyles. The teacher's role is to facilitate students in structuring their concepts, expressing their ideas, describing students phenomena and their interpretation, the creation of problems contextualized to the environment and their comprehension integrally, since the teacher has an essential role in this process, being the main responsible in stimulating his students for learning in mathematics (Pacheco & Andreis, 2017).

The skills and abilities of reasoning, representing and arguing mathematically according to the Common National Curricular Base (BNCC, 2017) affirms, especially at the

end of Elementary School, that students are expected to develop the ability to identify opportunities to use mathematics to solve problems, applying concepts, procedures and results to obtain solutions and interpret them according to the contexts of the situations.

The role of contextualization in the teaching and learning processes is, in addition to contributing to the understanding of scientific phenomena and knowledge, establishing relationships between these aspects and the context in which it is inserted, with criticality, to understand this context, overcoming the sense joint (Maffi et al., 2019).

Mathematical knowledge should lead students to create situations that are superior to those traditionally presented to them in the classroom, through action, interactivity and intervening in the reality in which they live, transforming it reflexively and critically. Understanding the contents and the emergence of new ideas are pillars that, according to Oliveira and Marin (2010), contribute to social transformation. This work aimed to investigate the pedagogical practice used in the context of mathematics in the classroom and highlight which factors contribute to this practice.

2. Methodology

The work constituted the report of the themes already worked per the “Contextualized Education” project established and experienced in E.E.I.F. Manoel Rodrigues do Nascimento. The research, of the case study type, is of a qualitative and quantitative nature. The study was carried out based on a semi-structured interview with the teachers and students of that school, in addition to observations and pedagogical practice. It involved as central issues the nature of the teachers' experiences through contextualization; the way teachers put them into practice in their math classes; the situations proposed in the classroom as promoters of subject-situation interaction. Thus, by studying the subject, teachers' conceptions about contextualization and their contribution to the learning of students at this school are identified and perceived, how contextualized teaching of mathematics is evaluated and the importance of bringing innovative, motivating, and meaningful situations for the classroom. For, it is a fact that despite the problems presented by the students, teachers seek various methodologies to facilitate learning, including activities that involve the student's daily life, interdisciplinarity, the historical context, and problem situations within mathematics itself.

For the study to occur positively, it hears the need to read books, monographs, and texts by some researched authors, mainly through the theoretical framework suggested by the PCN's for elementary education. For the meaning of mathematics for the student results from

the connections that he establishes between her and the other subjects, between her and her daily PCN (1997).

2.1. Contextualized education projects in mathematics teaching at Manoel Rodrigues do Nascimento

The Manoel Rodrigues do Nascimento Children's and Elementary School, from INEP 23093080, which is part of the municipal network of the city of Quiterianópolis-CE, experiences the Contextualized Education projects, which include social aspects experienced by its students and the community. It is about teaching approaching culture, the region, those who learn. It is teaching taking on the identity of its student, whether the school is rural or urban, it needs to be conceived to form a new look at the local and concrete reality, expanding and (re) meaning its role so that the education contemplates diversities (Aquino, 2016).

One way to apply Contextualized Education is through project design. Thus, the teaching-learning process takes place both at school and in the social environment. The students learn content in the classroom that can be practiced at home, just as, when returning to school, they take the results of the experiences and the report of their discoveries. Furthermore, the center of the educational process is the student and his reality.

The themes worked on in the Contextualized Education project allowed students to learn by knowing how to do and how to do, as well as knowing how to explain why they did it. Hence the importance of creating projects developed in the context of the school.

The Contextualized Education project that the Manoel Rodrigues do Nascimento school and put into practice as of January 2014, inserted all the subjects of the school curriculum, but in this case study, only the subject of mathematics was evidenced, identifying the existing relations of Day-to-day mathematics, establishing the main objectives and methodologies applied to its achievements. Note the importance of contextualization in schools in the interior of Ceará, which, through the Regional Institute of Appropriate Small Agriculture - IRPAA -BA, according to the regional nucleus of the Brazilian Semi-Arid Education Network (Resab), together with and Diocesan Caritas of Crateús (CDC). That since 2002 has promoted Contextualized Education for Living with the Semi-Arid Region (ECCS), the region is experiencing the challenge of promoting this contextualization that it had initially at the Escola Família Agrícola (EFA) Dom Fragoso in Bahia, then some schools in the municipal network of the city of Quiterianópolis - CE, which started to experiment with a pilot model in 2004, showing that this theme is already being discussed for some years.

The thematic projects of Contextualized Education proposed and put into practice by E.E.I.F. Manoel Rodrigues do Nascimento, from January 2014, highlighted the themes highlighted: “Water”, “Semi-arid”, “Storytelling” and “Sovereignty and Food and Nutritional Security”. Such themes worked on are related to living with the Brazilian semi-arid.

2.2. Data collection instruments

Problem situations were elaborated in the form of a questionnaire, according to the mathematical axes, introducing to each thematic through exemplification and contextualization, some programmatic mathematical contents, as well as assigning the instruments used in its realization; As well as, a semi-structured interview presenting the responses of two mathematics teachers from E.E.I.F. Manoel Rodrigues do Nascimento and the responses of four elementary school students, specifically from the 6th to the 9th grade, according to the questions proposed in the interview script about contextualized education in the teaching of mathematics.

2.3. Semi-structured interview

The research started with an interview with two mathematics teachers and students from that school. Then, two questionnaires (interview scripts) were elaborated: one for the two mathematics teachers, containing 10 questions, highlighting points of view about their perceptions and their ways of acting in the classroom; and another for twelve elementary school students (interview script containing 5 questions, chosen at random, with students from the various grades/year of elementary school, that is, comprising students from the 6th to the 9th grade), highlighting the opinions and reflections on their perceptions concerning classes contextualized in the teaching of mathematics.

The interview conducted with the teachers understood and/or considered in the questionings some personal, professional, and academic data of these, in addition to specific questions about the experiences acquired by each teacher with the practice of contextualized teaching of mathematics. It involved central issues the nature of the teachers' experiences through contextualization; the way they concretize them in their mathematics classes and the situations proposed in the classroom as promoters of subject-situation interaction. Also to operationalize and complement the data collection, an interview was conducted with the students, understanding relevant aspects such as personal data, academic career, and the

importance of contextualization, aiming to verify their degree of satisfaction with the classes and describe their conceptions and opinions about the learning acquired through contextualized teaching of mathematics.

2.4. Problem situations and axes of mathematics

In addition to this semi-structured interview, these teachers' classes were observed to have the previous contact with students and teachers, so that, at the time of the interview, they could be more comfortable talking. In four weeks, 16 classes were attended by the two mathematics teachers interviewed, with an average of 8 classes from each teacher. Problem situations were applied by inserting some mathematical content applied in the didactic books of Elementary School (6th to 9th grade), relating the themes of the Contextualized Education project worked at Manoel Rodrigues do Nascimento school, that is, contextualizing according to what was programmed in the curriculum proposal.

There is only the purpose of working with the axes of mathematics: number and operations, quantities and measures, space and form and treatment of information, when learning is applied to the students' life context, that is, to make them realize that they are learning that series of mathematical concepts to use them in everyday situations. Working with problem situations provides this applicability.

Problem situations were worked on in a Contextualized way, comprising the syllabus contents of the textbook “Vontade de Saber Matemática”, PNLD 2014, 2015 and 2016, FNDE/MEC, by Joamir Roberto de Souza and Patrícia Rosana Moreno Pataro, FTD, 2012. (Collection has chosen in 2014 for Elementary School - 6th to 9th, along with themes elaborated and proposed by the Contextualized Education project with the following themes “Water”, “Semi-arid” “Sovereignty and Food and Nutritional Security” “Storytelling” where they were A total of 53 questions were produced, passing through the four axes of mathematics: number and operations, quantities and measures, space and form and treatment of information, coming to work multiplication, division, Volume measures, operations with angle measures, 1st-degree equations, Interpretation of graphs and tables, probability, contemplating the contents present in classes from 6th to 9th.

From the answers to the multiple-choice questionnaire, the respective percentages were made in graphs representative of the answers using the Microsoft Office Excel 2016 Software.

3. Results and discussion

After the information was collected, the analyzes were made. Firstly, in the case study, texts on the contextualization in the teaching of the subject of mathematics were read to have a theoretical foundation. Then, the contextualized education project themes were exposed to show how professionals are adapting innovative ways to the teaching of mathematics. In the development of the articles and according to the data collected in the field research, a demonstration of the contextualized teaching practice was provided. Based on these data and through the problem situations, there was a great interest in students searching for solutions. From then on, with the semi-structured interview, the testimonies observed the essence of what was described and give meaning to the theme of the work. As a result, these units of meaning would therefore be the answers to the objectives in question.

Based on topic 2.6, of chapter 2, the answers of the teachers in the interview script were transcribed below, considering the questions asked, the aspects of contextualization, aiming to identify their conceptions about how to contextualize the teaching of mathematics, as well as to analyze the pedagogical practice of these teachers.

In the presentation of the teachers' profile, as well as throughout the analysis of the facts, Prof. A and Prof. B, according to the aid of the use of codes (numbers and letters), preserving the identity of the subjects involved in the study. The interview was held on October 12, 2015.

The transcripts of part of the professor's and professor's interviews presented below, portray personal and professional data and elements related to their academic training and teaching experience.

I'm 25 years old, and I'm single. I exercise my pedagogical practice in the public school E.E.I.F. Manoel Rodrigues do Nascimento for approximately 4 ½ years, a school in which he belongs to the municipal network of the city of Quiterianópolis / CE. I teach mathematics in the 7th, 8th and 9th-grade classes in the afternoon shift. I am graduated in the Degree Course in Semi-presential mathematics at the Federal University of Ceará (Prof. A).

I'm 30 years old, and I'm single. I practice as a teacher in the public school E.E.I.F. Manoel Rodrigues do Nascimento for approximately 10 years, a school in which he belongs to the city's municipal network Quiterianópolis / CE. I teach the subject of

mathematics in the class of the 6th year and the discipline of Geography in the classes from the 6th to the 9th year in the afternoon shift. My academic background is in Full Degree in mathematics (Prof. B).

Knowing the profile of educators is relevant for the investigation to occur in a precise way, understand their professional areas and methodological vision about contextualization, and investigate the updates that allow them to innovate their practice and curriculum (Silva, 2018).

The teachers' considerations, when asked about the methodology (s) and teaching resources they use in the classroom, are transcribed below:

I practice expository classes, exemplify the proposed content, propose textbook activities, simulations, workshops and complementary activities, always correcting the actions. I also work with contextualized and interdisciplinary issues through field research relating to everyday situations, which enable the awareness and appreciation of each student's reality, in addition to interpretation and logical reasoning (Prof. A)

I usually use the textbook and sometimes use multimedia resources to propose a more dynamic and attractive class, such as the Multimedia Projector, to project various media, such as computers, DVDs and video, to establish and understand the perspectives of students. My classes are expository, and I make a directed speech, I exemplify the proposed contents. I work with workshops, competitions, field classes, field research etc. (Prof. B).

The idea that Prof. Has about planned methods to contextualize, as a means of showing the applicability of mathematics, of bringing content to day-to-day life, is relevant and fundamental to the useful aspect of its teaching. Prof. B associates contextualization with aspects pertinent to the field of mathematics itself, envisioning its concretization in the interweaving between the contents presented in the discipline, or with other subjects in the curriculum. In this perspective, the activity of teaching practice points to curricular innovation pointed out by Silva (2018).

When asked if they use mathematical contextualization in the classroom and how the contextualization work is done, the teacher and the teacher stated the following:

Yes. The work is carried out from the implementation of the Contextualized Education project in schools in the city. From this, contexts are worked out in which the respective themes are covered. The textual analysis for analyzing data expressed in graphs and tables, supported by field research and internal research, correlated to the proposed theme and the coexistence with the students, enabling better interaction with them (Prof. A).

Yes. It is a very significant job, as we include school content in situations that make sense to students, incorporating their experiences. Thus, they can establish relationships between knowledge. In this knowledge construction process, there is a significant reciprocal relationship, allowing the student to produce, create, and not just to repeat strategies used when showing examples related to the content worked on (Prof. B).

In this perspective, knowing students' socio-cultural and economic context has an important meaning, especially when it comes to contextualization. Understanding the context means having better conditions to appropriate a given knowledge and information. Upon entering the classroom, the teacher is faced with a wide variety of students, whose goals, abilities and interests are different.

In this sense, trying to obtain a broad view of the meaning that the contents and mathematics itself has and the common interests of most of the group members can contribute so that the teacher can organize and carry out his work in a satisfactory way. In this trajectory to build and consolidate contextualized education, many challenges arise for the teacher: That they must assume a new posture in front of the various other ways of teaching and learning (Aquino, 2016).

When asked to give their opinion on the importance of Contextualization and its contribution to students' learning, the teachers interviewed positioned themselves, stating the following:

Contextualization regarding mathematics is of paramount importance. These are subjects in which they favor the student's understanding, bringing experiences in which they are of interest, thus becoming more explicit and better understood. Contextualization contributes to the transmission of knowledge, stimulates the development of cooperative work in which everyone gets involved, arouses the interest

and, mainly, the responsibility of students in the process of building their knowledge (Prof. A).

Contextualizing is a pedagogical practice that characterizes the school environment and its particularities to a living, active individual, having as its starting point the execution of an educational action that intercept constitutive elements in the student's school life with the contents applied in the classroom at a step that those significantly reinforce their understanding as they are adequately correlated (Prof. B).

In the perception of the interviewees who seek to develop the knowledge related to the life of their students, they create a great social appreciation because they represent the materialization of the efforts of various actors or collective subjects that not only they build a new educational proposal as well as promote the self-criticism of their teaching (Silva, 2018).

When asked to give their opinion on what it means to contextualize, teachers, according to their conceptions, stated the following:

I think that Contextualize is the act of teaching playfully incorporating trends in which they are experienced in the educational context of the curriculum proposal and student experience. The term contextualize refers to adding a situation, event or speech to the environment in which it is inserted (Prof. A).

For me, it was contextualizing means giving real meaning to what is being taught, in theory and practice. Bring the reality of the student's life to the learning space. Show the practical utility of everything that is conducted within the school. But reality does not need to be taught. It is real for those who live it. And the school environment must be a form of socio-cultural progression. In other words, it should provoke the student to desire to change (Prof. B).

Thus, it is perceived that it is very relevant to investigate the understanding and positioning of teachers about contextualization in mathematics teaching. The teachers' consideration when asked about the methods they use to contextualize the subject of mathematics relating to the themes of the Contextualized Education Project of the school under study are transcribed below:

I use simple and direct methods, analyzed, applied, and passed on from the curriculum proposal's programmatic content. I elaborate on problem situations, conduct field research, work with graphs and tables for better data presentation, etc. (Prof. A).

I use concrete methods to favor the construction of the student's knowledge. I elaborate on complementary activities, theater plays, workshops, gymkhanas, an exhibition of posters on the project's themes, presentation of songs and dances. I provide opportunities for students to explain and socialize to the class their methods to solve problems or any situations that allow different ways to find a solution (Prof. B).

In this sense, teachers were also asked about when (s) of the mathematics class (es) they use contextualization, thus proposing to observe the pedagogical practice of these teachers, being able to verify if the situations presented in the classroom of, in fact, they contribute to the significant construction of concepts, enabling greater understanding on the part of students. Here are some considerations:

I use contextualization daily in math classes and ask students to bring situations they experience in the social environment. I propose field research etc. Because I understand that contextualizing is based not only on a theme proposed in a project in the school environment but also on every act, conversation, and interaction in the classroom and the social environment, it is necessary to link school content to situations that make sense to the student, incorporating his experiences (Prof. A).

I contextualize daily in my classes, in the proposed activities, competitions, workshops, individual and group work, evaluations, etc. Finally, I contextualize the syllabus contents of the curricular proposal. The contextualization of the content brings importance to the student's daily life, shows that what is learned in the classroom has practical application in our lives. The context must consider what is significant for the student in his life and the world and the school's objectives (Prof. B).

In the view of these professors, it is up to them to articulate elements of actions that will allow them to listen to students and transform this into something that makes sense in the educational space. Relate the didactic content to the reality in which students live only

through this context. The teacher will have the means to adapt and, together with the student, come to produce significant knowledge (Aquino, 2016).

Finally, teachers were asked whether working with mathematics content in a contextualized way can be a resource to facilitate student learning and how it can contribute to the teaching-learning process. The responses presented were:

Yes. The contextualization in the teaching of mathematics is, without a doubt, a facilitating resource for learning, in addition to being a significant step for the educational development of the entire faculty of an educational institution. The contextualization gives meaning and meaning to mathematics, contributes to the student's awareness, creativity and understanding (Prof. A).

Yes, because it favors the interaction between the different areas of knowledge, it brings importance to the student's daily life. It allows students to understand the contents better and motivate them to study mathematics, showing what is learned in the classroom and has a practical extension (Prof. B).

Teachers state that the methodology adopted by them in a contextualized way provides meaningful learning. Teaching is a living, evolving process, with the search for quality and the improvement of pedagogical methods, a road to be followed to bring students to a complete understanding of the world in which they are inserted (Cortez & Darroz, 2017).

Semi-structured interviews were conducted with students, aiming to know the importance of contextualization in the teaching of mathematics and to verify if the methods used by the teachers in their pedagogical practice satisfy the learning of these students, knowing that the procedures of contextualized teaching applied in the classroom or outside it allows the student greater participation and removes him from the position of a mere spectator.

In the presentation of the students' profile, as well as throughout the analysis of the facts, the students were identified as Student 6th, Student 7th, Student 8th and Student 9th, according to the aid of the use of codes (numbers and letters), preserving the identity of the subjects involved. The interview was held on November 12, 2015.

The transcripts of part of the students' interviews, presented below, portray some personal data, student career, name of the school, and school type in which they study.

I am 11 years old. I'm female. I am in 6th grade at E.E.I.F. Manoel Rodrigues do Nascimento this year, 2015. I have been studying at this school for approximately 7 years. The discipline that I like to study most is mathematics (Student 6th).

I'm 12 years old. I'm female. I am in 7th grade at E.E.I.F. Manoel Rodrigues do Nascimento this year, 2015. I have studied at this school for approximately 3 years. The discipline I most enjoy studying is mathematics (Student 7).

I'm 13 years old. I'm female. I am in 8th grade at the public school E.E.I.F. Manoel Rodrigues do Nascimento this year 2015. I have been studying at this school for approximately 6 years. The discipline that I like to study most is mathematics (Student 8th).

I'm 14 years old. I'm male. I am in 9th grade at the public school E.E.I.F. Manoel Rodrigues do Nascimento this year 2015. I have been studying at this school for approximately 7 years. The discipline that I like to study most is mathematics (Student 9th).

Students show through their speeches the importance of mathematics in their day postpones. Thus, an education that is willing to consider the human being as the subject of his learning and not as an object, where his experience, reality, and way of seeing the world are considered, making this learning authentic for him (Aquino, 2016).

As considerações dos alunos ao serem questionados sobre a importância da Matemática no dia-a-dia estão transcritas em seguida:

Mathematics is a discipline that some students find difficult, harmful, but I don't. It is very important in various situations in our daily lives, such as when I buy something at the store. So, with mathematics, we learn to count, calculate, etc. (Student 6th).

It is very important because it is in the clothes I buy, at my age, in my weight, on my phone, on my wristwatch and the wall clock in my house and also on the electricity, water and energy bills etc. Finally, Mathematics is present in my day-to-day life in various things and situations (Student 7).

Mathematics is present in all the activities we do during the day, that's why it is so important. Without mathematics, we would not be able, for example, to research product prices on the internet or in stores, use the telephone to talk to people, account for debts, know the hours, etc. (Student 8th).

I think that mathematics is a way to simplify my life. Because she teaches me how to count, calculate, and solve problems, it is present in budgets, purchases, sales, debts, household furniture, culinary recipes, etc. It is a fact that numbers, geometric figures, the relationships between quantities are everywhere in my day-to-day life (Student 9th).

It is noted through the reports that mathematics worked in a contextualized way that starts to make sense to these students. Mathematics plays a fundamental role in society, from the simple purchase of a product to the most complex everyday situations. At first, the student develops simpler themes linked to family life and then moves towards a more complex socioeconomic nature (Andrade & Fernandes, 2016).

When asked to give an opinion, they defend the idea that mathematics teaching should be contextualized and its activities linked to reality. The interviewed students positioned themselves affirming the following:

Yes, because I think it makes studying a lot easier, it becomes even easier to know Mathematics. The activities to be developed in the classroom should point out possible applications of mathematical concepts in real situations, valuing our previous knowledge (Student 6th).

Yes, because it becomes easier to learn from the reality of everyday life. Everything we use numbers is related to Mathematics. It is a fact that exploring everyday life to make sense of school mathematics, or teaching mathematics from concrete situations, are ways to ensure the success of teaching and learning mathematics (Student 7th).

Yes. The contextualization of Mathematics enables us to better learn because of taking into account the activities we carry out outside the school as well, such as, for example, field classes, awareness of how to save water, know the types of soil, quantity and quality of food we consume, etc. (Student 8th).

Yes, because with contextualized Mathematics it is easier to learn, because it takes the student out of the monotonous daily routine and takes him to learn not only inside the classroom but outside as well, thus boosting mathematics classes, valuing teaching practice situations and learning mathematics at school through concrete situations in which the subjects act, producing meanings (Student 9th).

This shows the students' position on their perspective on the classes' experience contextualizes the easy assimilation of the contents that interact with their daily lives.

Finally, students were asked whether the contextualized ways that mathematics teachers work in the school understudy provide meaningful learning using mathematical Contextualization in the classroom. The responses presented were:

Yes, because several things I didn't know, I am learning. Contextualization is the best teaching for students. Classes are fun, attractive, dynamic. It is a great project that focuses not only on the textbook contents but also on situations in reality (Student 6).

Yes, because they teach how to develop a higher mathematical knowledge through the manipulation of simpler and more known concepts by the student, from a given more complex content, which can improve the understanding of another already known, in addition to proposing everyday situations -day, through data and information, enabling knowledge and intelligence, and so we learn a lot more (Student 7th).

Yes. It gives us an idea about the themes worked in the context in the form of problems and allows us to raise awareness about everyday situations, such as how many liters of water we spend during the day, how we use the soil, what agricultural foods we produce, and so on. We create a conscious world, taking better care of our place (Student 8th).

Yes, because the Mathematics contextualized in the way it is being applied, besides learning the most accessible discipline, also helps raise awareness and learn more about our place, showing the Mathematics more applicable in reality, which allows greater understanding by the students (Student 9th).

When interpreting data and information, students do it within a framework whose most fundamental aspect in the history of their previous experiences. The approach between

the form and content of teaching mathematics does not allow students to grasp a subject; apprehending such a structure means learning how things relate.

Thinking about meaningful learning implies that education presupposes an action of a dynamic character, which requires teaching actions directed for students to deepen and expand the meanings they develop through their involvement in learning activities. For a North American psychologist and physician and considered the father of the Theory of Meaningful Learning, the human mind is highly organized and the formation of concepts structured in a hierarchy based on the experiences of the individual (Sousa et al., 2018).

According to the results obtained through data analysis, teachers' conceptions about contextualization and their contribution to the learning of students at this school are identified and perceived and how the contextualized teaching of school is evaluated. Mathematics and the importance of bringing innovative, motivating and meaningful situations to the classroom. It is a fact that teachers seek several methodologies to facilitate learning, including activities that involve the student's daily life, interdisciplinarity, the historical context and problem situations within mathematics itself.

In a way, Contextualized Education gives meaning to areas of knowledge. The student understands the reason for learning a certain subject and starts to be interested in it, to take a liking for the study. In this way, the school begins to use a good inclusion strategy, addressing the precept "know to value". The methodological conception implies that the contents are related to a series of other events, covering different areas and therefore need to be addressed to allow for the educating a complete view of knowledge, in a way connected to the ends, without leaving the idea that the content is in a specific curriculum just for being (Cortez & Darroz, 2017).

Students who had learning difficulties at the school understudy, which were undisciplined, who added to the list of dropouts and repetition, became "objects of attention". When these students felt understood in their ideals, valued in their potential, they developed self-esteem and started to study more. Since then, their effort, determination, commitment and creativity are perceived in thematic projects of Contextualized Education.

The Manoel Rodrigues do Nascimento school looked for other ways to evaluate students in the teaching of mathematics, considering their competences and abilities. He found a way to help and show a reality that goes hand in hand with popular culture, drawing general teachings. Teachers' competence and motivation were fundamental to the success of their schedules, their usual or alternative projects. Hence, the school contextualizes portraying

its community, observing aptitudes, becoming supportive, reflecting, and trying to make people aware of world problems through social relevance matters.

When analyzing the testimonies of teachers and students in the semi-structured interview, a lot of information was gathered, which allowed a reflective analysis of these teachers' teaching practices and their conceptions about the contextualization in the teaching of mathematics. Besides, it was possible to verify students' satisfaction with classes and their opinions about learning mathematics.

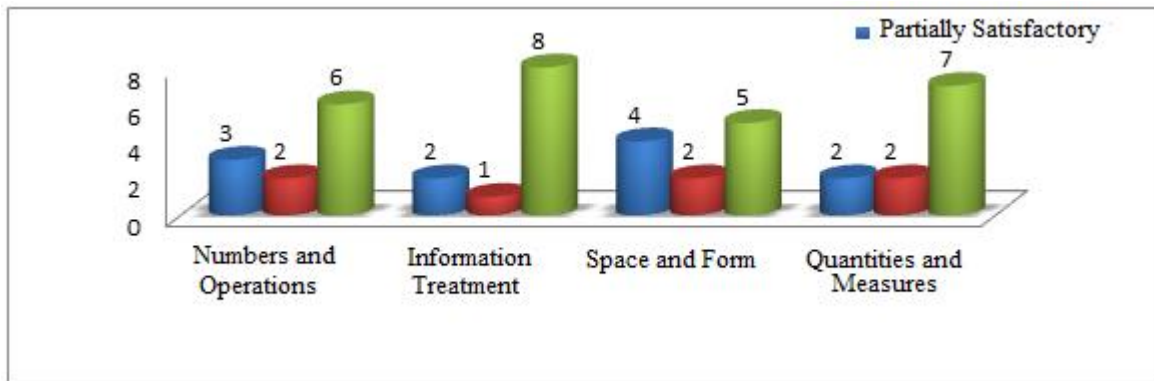
It can be noted that teachers who use contextualization in their classes perceive that students, in general, have great difficulty in the discipline of mathematics, which is one of the reasons that most lead them to believe that contextualization is a way to remedy students' difficulties, thus allowing them to take pleasure in learning mathematics and allowing them to express their opinions and participate in the construction of their knowledge.

Teachers declared to work with contextualized and interdisciplinary issues, which value the student's interpretation and logical reasoning, which shows that contextualization is within teachers' methodologies in the classroom.

Therefore, observing the teachers' classes, it was noticed that they register the studies contextualized in the school diary and the monthly plans do according to what was programmed in the curricular proposal, through the contents proposed in the textbooks of the subject of mathematics and establishing relations with other curricular or even planning areas, but always putting the focus on context. It is a fact that in the school understudy, there is no lack of material to subsidize teachers in carrying out activities. Still, it also proposes training to guide them in terms of context, thus providing support for teachers and students.

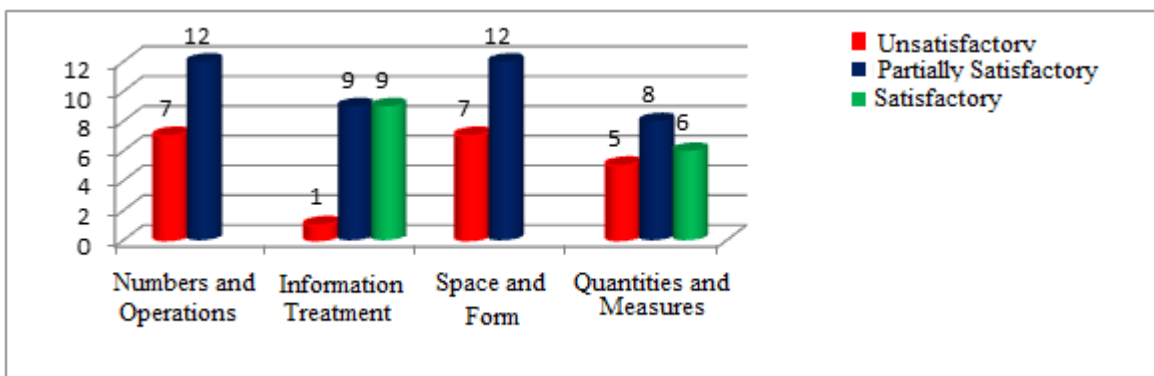
After these analyzes and discussions of the interviews, it was verified from problem situations and axes of mathematics, the axes of mathematics that correspond to the diagnosis of elementary school students from that school who are involved in the Contextualized Education project, specifically in the 6th to 9th-grade classes, are shown below. The 1st semester of the year 2015, I highlight that the 6th year class has 11 students, the 7th year class has 19 students, the 8th year class has 21 students, and the 9th class has 11 students. See graphs:

Graph 1. Axes of Mathematics for the 6th Grade class.



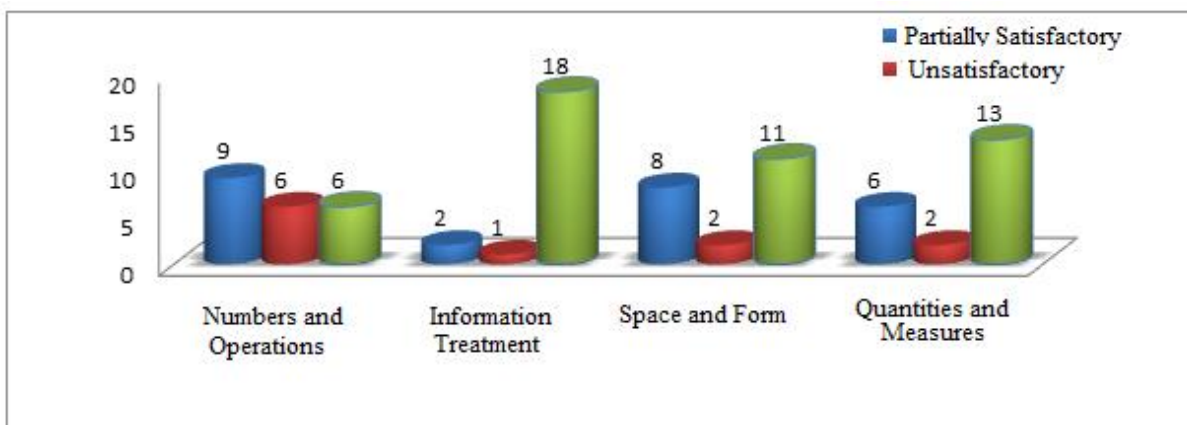
Source: Author himself.

Graph 2. Axes of Mathematics of the 7th grade class.



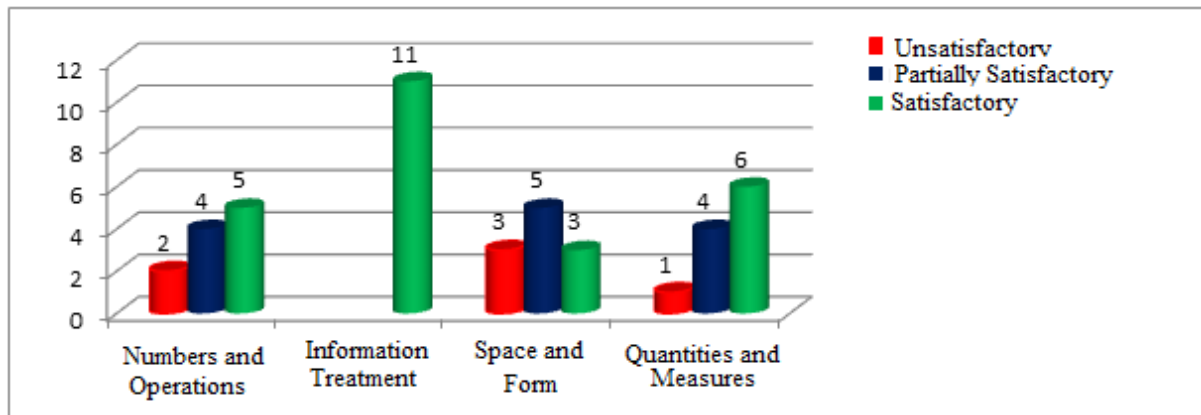
Source: Author himself.

Graph 3. Mathematics axes of the 8th grade class.



Source: Author himself.

Graph 4. Mathematics axes of the 9th grade class.



Source: Author himself.

This diagnosis facilitates the teacher's work to resolve doubts in the descriptors that students have more difficulty with (Graph 1-4); thus, we can perceive the students' difficulties in understanding the numbers and operations, information processing, space and form quantities and measures. The most positive and satisfactory results were obtained in the information treatment axis, showing that to have positive knowledge, the content mustn't be decontextualized and fragmented. We know that mathematics is a very important discipline because everything we do has calculations and formulas, placing students in a process where learning will value logical and mathematical reasoning. There must be more contextualized, playful and differentiated classes with some practical classes for there to be constructive learning on the part of the students.

Each person's mathematical ability concept is one of the most important factors in the success or failure of their learning. For this reason, the work must enable the student to realize that he is capable of solving problems, of reasoning, as he does in everyday situations. This stimulus should not be confused with facilitation in the teaching and learning process. Therefore, there is a tendency for the teacher to need to develop the skills to understand, communicate, use and explain concepts and procedures based on mathematical thinking.

When configured as something difficult to access and understand, and with little context, mathematics produces representations and feelings that will influence learning development. To improve the ability to read, interpret, and solve problems is part of mathematical knowledge construction. Besides, exploring subjects of interest to students arouses their curiosity, involves them searching for new knowledge and enriches those already acquired. As a teaching methodology, problem-solving is significant for developing

logical reasoning and developing students' motivation and enthusiasm when studying mathematics (Souza et al., 2018).

Such an approached problem thus contributes to the need for more meaningful interaction in the classroom. The contextualization of knowledge is a pedagogical methodology that should occupy a more prominent place in the analysis of didactics today, being a didactic concept of extreme importance for expanding the meaning of school education (Pais, 2008).

When the students' everyday situations are dealt with at school, in some way, these connections bring meaning and enable the student to exercise citizenship. Furthermore, when the teacher brings up everyday situations, the student internalizes the concepts in a meaningful way, promoting school mathematics formalities to be constructed in a practical-utitarian way, taking such concepts, even if limited, to everyday use (Silveira, 2012).

School education is noted, in its vast majority, as a reality apart from contemporary events. On certain occasions, due to the narrowing of this reality, to work on some theorem, some law, everyday situations are cited, however superficially and without establishing relationships that make it possible to signify such concepts, both about mathematical theories and the real situations of life. It is noticed that in textbook collections, this relationship already exists and is structured in a significant way. A large part of the books is based on reality. The chapters exemplify everyday situations that bring meaning to the themes of the subjects (Ribeiro, 2010; Dante, 2010; Souza, 2010).

In this sense, it is essential to consider the student's prior knowledge of knowledge production. "The teacher must seek to rescue existing relationships in reality that can create alternative conditions, aiming at understanding and intervening in this social context where knowledge is produced" (Mendes, 2009, p. 124).

Therefore, the mathematics teacher must create learning situations that arouse the students' interest, seeking to make the classes more dynamic and attractive. Thus, contextualizing the contents and placing the students' daily experiences as the main focus in the teaching and learning process is significant in mathematics teaching.

Daily life is impregnated with knowledge and cultural practices. Teaching cannot be disconnected from the student's life because, at all times, individuals are comparing, classifying, quantifying, measuring, explaining, generalizing, inferring and, in some way, way, evaluating, using the material and intellectual instruments specific to their culture (D'Ambrósio, 2009).

Differentiated teaching practices can change this situation. They seek to encourage these students to understand mathematics as part of their daily lives, enabling meaningful learning and not just as a difficult discipline to learn. Thus, teaching as a contextualized practice can help bring theory closer to the students' daily lives.

One of the mathematics's purposes is its practicality. It allows in solving everyday problems. However, learning mathematics should not be reduced to the problems of practical life. Another objective is the instrumental character of mathematics, precious for the development of systematic observation procedures, the different fields of mathematics - arithmetic, geometric, algebraic, metric, statistics, probabilistic, combinatorial - must integrate, in an articulated way, the activities and experiences mathematics that will be developed by the student, one of the most current aspects that the teaching of mathematics must contemplate is the selection and organization of relevant information (Barroso, 2007).

One way that allows the teacher to propose teaching that contemplates contextualization and a link between areas of knowledge is teaching by projects. This methodology can trigger activities in which students show interest and are motivated for their development. Hence, through planning, the school has the opportunity to enable the development of a teaching and learning process that relates different school contents in a way paid in. For Spinelli (2011, p. 13), "the subject builds his knowledge when he relates several conceptual meanings, with each other, thus composing a network of meanings".

The importance of mathematics and its usefulness is evident. It has of fundamental significance for the integral development of the capacities and abilities of the human being. It assists in developing logical reasoning and the ability to create skills (Leonardo et al. 2014).

When planning and developing contextualized school practices, the teacher does not have to worry about exhausting the contents at once, but systematizing them to be applied by students in new situations, being explored through dialogue, questioning and exemplification, enabling the understanding of students so that the teaching-learning process is continuous and contextualization develops in an enriching and meaningful way (Sousa et al., 2018). Several factors can be raised as causing the low performance in mathematics presented by students, such as inadequate methodologies, incapacitated, outdated and poorly paid teachers, outdated teaching material, lack of student motivation, a systematic study based on memorization, decontextualized classes, among others. When the student has an affinity with mathematics and its content, little interference in learning the methodology, the didactic material used and the way the teacher conducts the class, each student reacts differently. These factors become significant for those who have difficulties in learning (Soares, 2009).

However, the contextualized treatment of knowledge is one of the resources that the school has to remove the student from a passive spectator's condition. The idea that the teaching of mathematics should be contextualized and its activities linked to reality has been gaining more and more space in various authors' speeches and research. In this sense, teachers need to rethink the elaboration of activities, enabling students to take concrete actions that lead them to reflect and experiment with different ways of assimilating mathematical and geometric concepts and contents.

4. Final Considerations

At the end of this work, as significant as the path taken during the investigation process, was the challenge of being able to outline ideas on the guiding questions of the research, such as teachers' conceptions about contextualization, the contributions that this resource can bring to student learning, as well as how these conceptions are carried out in the mathematics teaching practices of the teachers participating in this study. Thus, from the analysis of the data collected, some considerations were made.

This work shows that the teaching of mathematics contextualized as a form of articulation with other knowledge should be seen as another teaching tool, offering students a new learning way. In this way, the educator instigates the student to research and learn together, being, in fact, a continuous exchange of information, using different teaching methods and appropriate to the context. Based on this, this work's objective was to investigate the teaching practices of E.E.I.F. Manoel Rodrigues do Nascimento. In this approach, the reported data were intended to analyze some units of the mathematics teaching universe, paving the way for a later understanding of the generalities of the theme or, at least, to establish the bases for an upcoming more systematic and precise investigation.

Given these considerations, it is clear that the entire path taken in this research indicates the need for further studies to understand the role of contextualization within mathematics teachers' pedagogical practice. Thus, it is necessary to advance this discussion, to elaborate projects as it is being carried out in the school mentioned in the case study of this work; verify the contributions of contextualization in the mathematics learning process; analyze a practice that brings contextualization as a resource for classes or to carry out contextualized intervention work in a classroom, but these are, for now, suggestions for work to be performed later.

Finally, it is understood that Contextualized Education in the teaching of mathematics enables the construction of the student's knowledge according to his reality, mainly due to the applicability of mathematics, stimulates creativity, investigation and critical analysis of results, contributing in a way essential for the teaching-learning process.

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