ORIGINAL ARTICLE

OLIVEIRA, José Luiz de Jesus Egues de [1], SILVA, Edevaldo Maximo da [2], SANTOS, Cleidison Da Silva [3], PONTES, Dalila Fonseca [4], SILVA, Jandaira Fernandes da [5], QUEIROZ, Jose Pereira de [6], SANTANA, Zenóbia Conceição Castro [7]

OLIVEIRA, José Luiz de Jesus Egues de. Et al. Educational construction of geometry and the use of concrete materials as a learning process. Revista Científica Multidisciplinar Núcleo do Conhecimento. Year 05, Ed. 10, Vol. 10, pp. 46-61. October 2020. ISSN: 2448-0959, Access Link: https://www.nucleodoconhecimento.com.br/education/educational-construction

Contents

SUMMARY

The research stood out for a didactic reflection that meets the need for experimental constructions in the classroom, with concrete materials to assist in the process of teaching and learning geometry in elementary school. In this sense of attributing an analysis to this problem, we have as axis, mathematics education, as a way to stimulate students for the development of workshops in which they aimed at the construction of didactic materials as a process of learning mathematics. The process of constructing the concept of geometry that attribute the skills and competencies to be developed in the students at this stage, allowed the same to develop a particular type of thought to understand, describe and represent, in an organized way, the geometric spaces, informing the importance that this content has in their social life as a citizen. Through the construction of geometric figures with manipulated materials, we study all the concepts of the figure, through this tool, thus stimulating the interest and motivation of the students, providing them with geometric and mathematical reasoning. The definitions of geometry can be constructed successively, taking as a basis the previous knowledge of the students or not, in which we highlight that educators should create activities in which students make inquiries of situations related to geometric dimensions, thus having experiences of meaning and direction of themselves and of some figure inserted in the space. However, for the absorption of this teaching and learning process, in addition to presenting theories to the students, it was necessary to show the geometric figures by their physical characteristics, that is, in such a way that nature provides us and not only by its properties and defined concepts. Finally, the research allowed us to analyze the intellectual capacity of each student selected for this purpose.

Key Words: Mathematics Education, educational construction, geometry.

1. INTRODUCTION

As professionals of Education and diverse areas, we think of this research driven by the desire to dialogue on the teaching of learning mathematics, more specifically observe the importance of Geometry in the educational menu of the student and, in particular, in elementary school. Also as researchers and connoisseurs of geometric spaces, we highlight the argument of Malba Tahan (1967, p.31) in his text that says: “What makes it difficult to teach mathematics is the unalterable Latin habit of always starting with the abstract, without going through concrete”. Other authors also have very relevant importance on this part of mathematics. We will also address the almost abandonment of Geometry in Basic Education, reported in some studies that we approach as a basis for this work. We also emphasize the specificities regarding the teaching of geometry content in the context of the physical world for teaching, as well as the skills that this area of mathematics must provide for students to be included in a de facto educational society.

However, the teaching-learning process of Mathematics is the subject of much study and discussion, because new methodologies always arise to meet a demand that is constantly changing in various teaching modalities.

Given the specificities of the learning process of mathematics in elementary school, and the perspective of developing tools to stimulate students' intellectual capacity and at the same time value the use of mathematics in everyday life in which countless problems can be solved, the discussion of the importance of teaching content involving geometry comes to the fore, because it is a very interesting path , it is extremely important to be able to provide the student with a more organized view of the world in which he lives. In fact, it is very important to study this area of mathematics and is defended by several educators, in which they are discussed here and discussed below, according to the importance and specificities of this area.

We try with this research to contribute to the teaching of mathematics education, based on the development of skills and competencies in students.

The development of workshops that aimed at the construction of didactic manipulable materials for teaching and learning process, exploring the geometric concepts that contemplate the skills and competencies to be developed by students during the stage called "educational construction", will enable the student to develop a particular type of thought to understand, describe and represent, in an organized way, the world in which he lives , informing you how important this content is. Therefore, one day they can use this educational product in their social life, or in daily life, besides allowing an increase in the view of the use of geometric basic knowledge.

2. PEDAGOGICAL DIDACTIC TRENDS IN GEOMETRY TEACHING

We believe that the educational construction fixed the learning process thus storing the transmitted content, which were carried out with manipulated concrete materials.

According to Duval (1995), geometry involves three forms of cognitive process: which fill specific epistemological functions;

> Visualization for the heuristic exploration of a complex situation; Construction of configurations, which can be worked as a model, in which the actions performed represented and the observed results are linked to the mathematical objects represented; Reasoning, which is the process that leads to proof and explanation.

(DUVAL, 1995).

According to the author, these three species of cognitive processes are intertwined in their synergy and cognitively necessary for the proficiency of geometry. On the other hand, the heuristic of geometry problems refers to a spatial record that gives way to forms of autonomous interpretations.

For Duval (1988), geometry problems present a great originality in relation to many mathematical tasks that can be proposed to students. Furthermore, the author says that favoring the development of cognitive functions by organizing mathematically close geometry problems that require the same knowledge, determines a cognitive categorization indispensable to learning.

According to Machado (2005), most of the problems of teaching and learning geometry are of didactic and linguistic origin. For Duval (1995), the coordination of the different records of representation (algebraic writing, geometric figures, discourse in the natural language) linked to the treatment of knowledge does not operate spontaneously, even in the course of a teaching that mobilizes this diversity of records.

However, the proposed study should enable the student to make a different interpretation of geometry around them, because exercising in his memory through contact, that is, "the concrete", they can acquire knowledge in this educational context, and that will serve as a tool to be incorporated into their daily life.

According to Fiorentini:

> Several methodological changes are pointed out as teaching trends that seek to privilege student participation, considering the construction of knowledge as a form of learning. Mathematical knowledge emerges from the physical world and is extracted by man through the senses. (FIORENTINI, 1995, p.9).

The National Curricular Parameters (PCN, 1998) also recognize the lack of prominence that has been given to this area of Mathematics and also highlights that it develops a fundamental role in the formation of the student as a citizen.

For (MACHADO, 2005), most of the problems of teaching and learning geometry are of didactic and linguistic origin.

The above authors cite these aspects in the learning processes that are intertwined in their synergy and cognitively necessary for the proficiency of geometry. On the other hand, the heuristic of geometry problems refers to a spatial record that gives way to forms of autonomous interpretations.

We hope that the applied methodology will be a pedagogical trend in our daily life in this area worked, and that we can actually use it in our classes, as a learning tool in geometry classes.

3. THE USE OF CONCRETE MATERIALS IN THE TEACHING OF GEOMETRY

The obstacles and difficulties encountered by students at the time of learning mathematics itself are innumerable. There are those who cannot understand it and even the teaching teacher is disapproved in a statement and those who, when approved, still fail to apply the acquired knowledge. That is, they do not understand its real importance.

Thus, several studies show that the use of manipulated materials produces higher performance in students than their use, at all ages and in all years of school. This use is a methodological indication that is valued from the moment of acquisition to the moment of construction of concepts that can happen at all levels of education. Thus the question arises: can concrete material as pedagogical use facilitate the teaching and learning of mathematics? According to Carraher and Schilemann (1988), they state in their research that “we do not need objects in the classroom, but objectives. We need situations in which solving a problem implies the use of mathematical logical principles to be taught” (p.179). This is because the material “despite being formed by objectives, can be considered as a set of ‘abstract’ objects found only in school for the purpose of teaching, and has no connection with the child’s world” (p.180). For him, concrete for children is not necessary, because manipulative objects can be abstract in the hands in various situations that the child will have to face socially. On the other hand, Fiorentini and Miorim (1990), confirm their words spoken above and explain that behind each material used, a vision of mathematical education of man and the world is hidden. This means that there is a pedagogical proposal that justifies this use.

From this research, we also found questions for the public of children with special needs. How would this use happen? What would the teaching and learning process look like for these children? Thus, the Italian educator and also physician Maria Montessori, responds to us bringing results after research with exceptional children, developed at the beginning of this century with various manipulative materials focusing on mathematics itself. It was believed that there was no learning without action: “nothing should be given to the child, in the field of mathematics, without first presenting to him a concrete situation that leads him to act to think, to experiment, to discover, and hence, to immerse himself in abstraction”. (AZEVEDO, 1979, p. 27)

Following these reflections we perceive that this concrete material mentioned here and placed as an object of applicability for effective learning makes us realize that there is a need for an exercise of the synthetic and analytical faculties of the child as the author below states that:

> The synthetic and analytical faculties of the child should be exercised. Synthetic to allow the student to build a concept from the concrete. Analytical because in this process the child discerns in the object those elements that constitutes globalization. For this the object has to be mobile, which can undergo a transformation so that the child can identify the operation that is underlying (CASTELUNUOVO, 1970, p.82-91)

The manipulated materials can be fundamental for learning to occur and not always the most appropriate is the one already built or more beautiful. By encouraging the educational construction by children we are thinking of facilitating the learning process and it is at this moment that we realize that the concrete participation of it makes the said process actually have a validation. Thus we are compared with the national curriculum of basic education that establishes: Essential competencies (IDEB, 2001), regarding the use of resources, states that:

> Manipulated materials of various types is, throughout all schooling, a privileged resource as a starting point or support of many school tasks, in particular those aimed at promoting research activities and mathematical communication between

> students… […] All students should learn to use not only the elementary calculator, but also, as they progress in basic education, students should have the opportunity to work with the spreadsheet and with various educational programs, including function charts and dynamic geometry (2001, p.17).

4. METHODOLOGY

The methodology used is qualitative, bibliographic and experimental. The research was developed during pedagogical workshops, organized by modules that allowed at the same time to develop the activities related to "Constructionof Didactic Materials as Teaching and Learning Process", which we characterize here as "educational construction".

We did the workshops with meetings that were divided in order to put the student in contact with the theme. We apply the concepts of the figures related to the selected texts of the mathematics book of the discipline of geometry. Other readings were selected according to the development of the work. We used as concepts of geometric figure planning in two-dimensional space and we assemble geometric figures of three-dimensional space. In this phase, the learning of geometry is realized by activities related to action, there must be a predominance of concrete over the symbolic, therefore the student manipulates and constructs objects of various forms to then analyze their physical and geometric characteristics. In this perspective, geometric activities should be carried out that allow the exploration of concepts related to space and form, contributing to the course being focused on the formation of an inserted student, because they must understand the geometric world in which they live.

4.1 OF THE APPLIED WORKSHOPS

Two workshops were held in a 9th grade class of elementary school, composed of 27 students from the morning of the State School Councilor Bento Muniz of the municipality of Tangará da Serra-MT. Thus, a diagnostic evaluation was applied, also conceived as a pre-test, and with the objective of having information on the students' previous knowledge in the context of Euclidean geometry, because according to the LDB-Law of Guidelines and National Basis

(1961)

> The guidelines and proposals issued by the MEC (Ministry of Education) highlight and reinforce the need to recognize the students' previous knowledge, using them as a tool that facilitates learning and as a motivating factor, because in this way, the student becomes active subjects in the schooling process, no longer being mere recipients of knowledge.

The figures present the questionnaire submitted, as well as the answers of some students. The first three questions aimed to verify the students' understanding in the conception of the definitions of polygons and polyhedra, as well as the denomination of some elementary geometric figures. We observed that most of the students had not conceived the definitions questioned, which goes against the statements of Almouloud (2005) in which the author states that several studies point to this discipline as one of the learning problems. And this becomes more evident when we look at the other issues contained in the test.

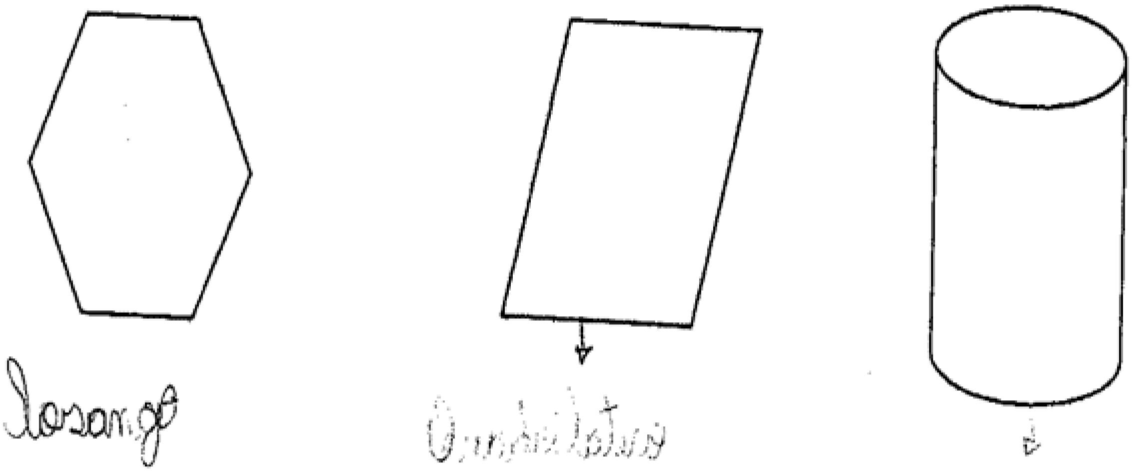
Figure 01 – APPLIED PROPOSAL.

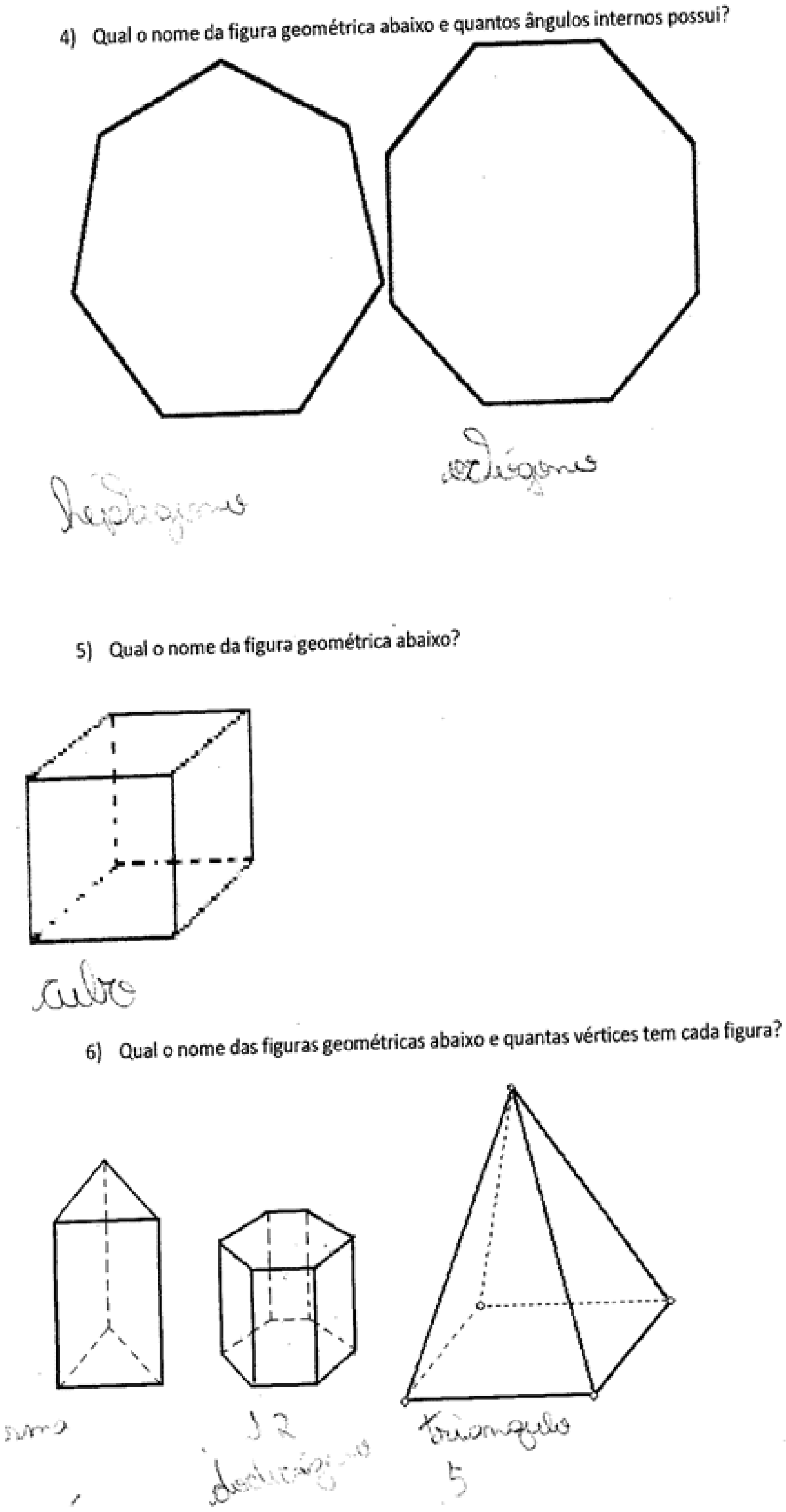
Avaliação de Geometria

1) O que é um polígono?

2) O que é um poliedro?

3) Qual o nome das figuras geométricas abaixo? Justifique





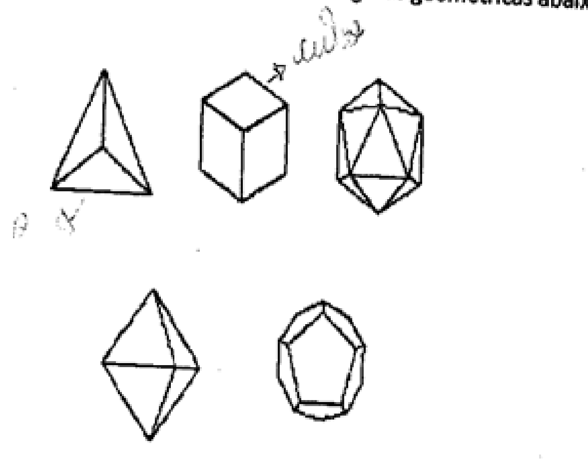
4) Qual o nome da figura geométrica abaixo e quantos ângulos internos possui?

5) Qual o nome da figura geométrica abaixo?

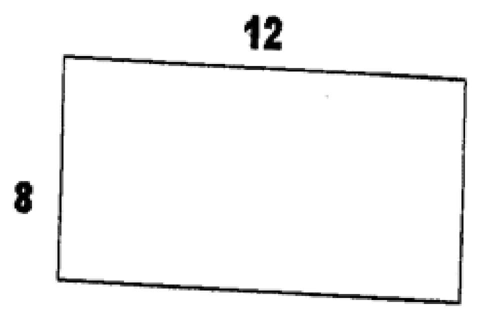
6) Qual o nome das figuras geométricas abaixo e quantas vértices tem cada figura?

Figure 2 – TEST CONTINUITY

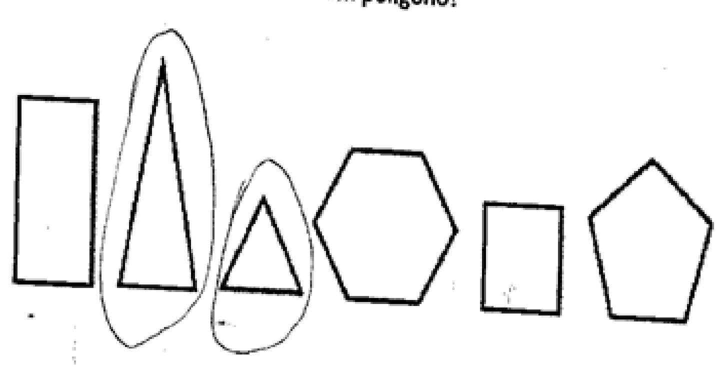
7) Qual o nome das figuras geométricas abaixo?



8) Calcule a área do retangulo?



9) Quais das figuras não é um polígono?

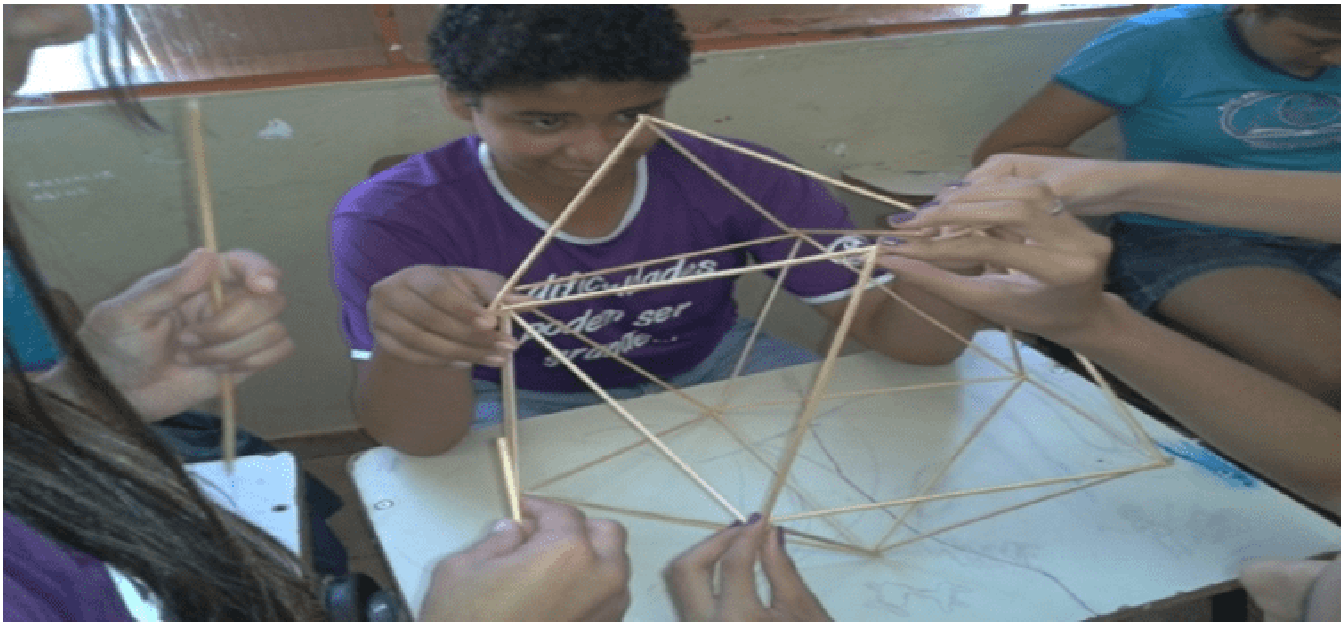


Source: Own (2011)

Figure – 3. Constructions

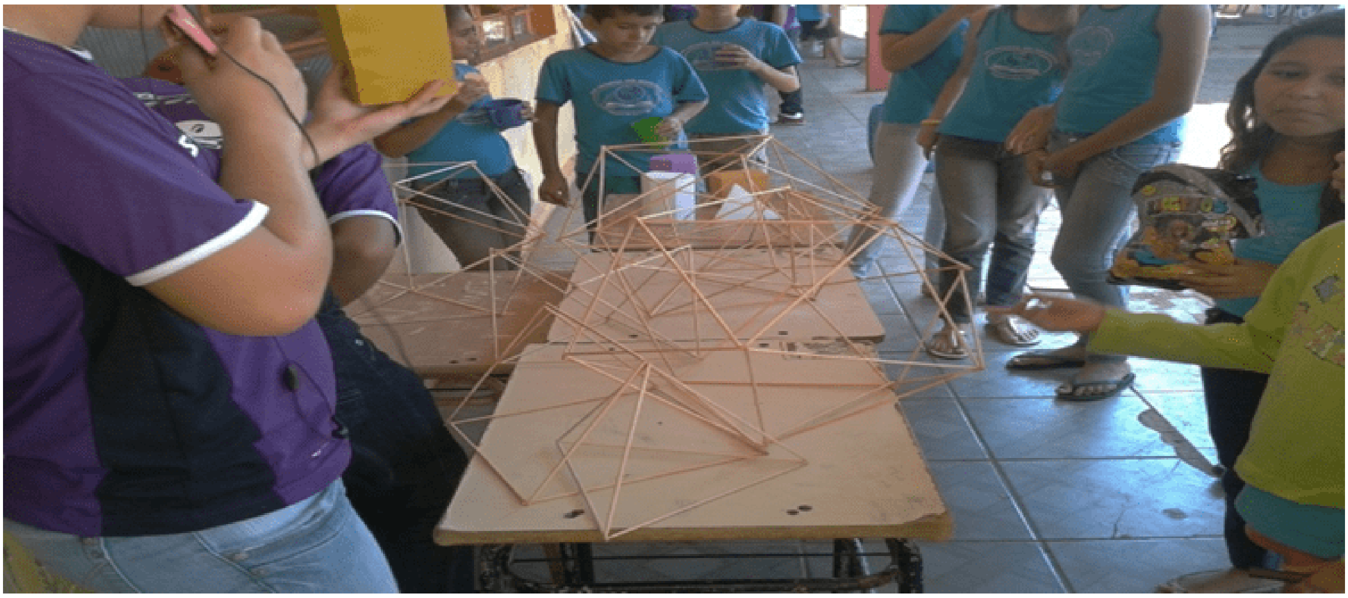
Source: Own (2011)

Figure – 4. Constructions



Source: Own (2011)

Figure – 5. Constructions



Source: Own (2011)

In this investigation, it was found that the vast majority of students do not recognize the polygonal and non-polygonal forms and do not know how to relate them to the number of their sides and vertices, and still show to segment the geometry of their daily lives, although daily life is the promoter of the study of geometry as stated by the author below:

> Mathematical knowledge emerges from the physical world and is extracted by man through the senses" and Miguel and Miorim, (1986, p.66), who state, "geometry is so important to humanity that it makes it inconceivable to question the need to study it in school, because the world in which we live is almost spontaneously geometric and its use in everyday life is almost a human necessity. (FIORENTINI, 1995 p. 9.)

Perhaps this situation will become aggravated by the way teachers present this content, which according to the PCN is as important as in the past.

> The issues related to the forms and relationships between them, with the possibilities of space occupation, with the location and displacement of objects in space, seen from different angles are as necessary today as they were in the past. Everyday situations and the exercise of various professions, such as engineering, biochemistry, choreography, architecture, mechanics, etc., require the individual's ability to think geometrically (PCNs p. 122 – 1998).

In a second moment, constructions of the flat figures were proposed. During the constructions it was found that students really understand the geometric shapes presented through the constructions with cardboard, that is, the concrete. Square, rectangular, triangular, circular, pentagonal, hexagonal, heptagonal, antitogonal, eneagonal, decagonal, dodecagonal, tridecagonal, tetradecagonal, pentadecagonal, all designed in cartolines to be cut and finally constructed were assembled. We observed that the construction by the students contributed to the creation of meanings of the students themselves, with an interest in participating more than if these figures were presented on the board by the teacher. What reinforces the sayings of Azevedo (2006, p.27), who believed that there was no learning without action: "nothing should be given to the child, in the field of mathematics, without first presenting to him a concrete situation that leads him to act to think, to experiment, to discover, and hence, to immerse himself in abstraction".

A space was also opened where the students had the opportunity to question and argue about the activities performed and the relationship of the forms in our coexistence. But after the discussion was opened for comment, some students only contributed if they were instigated and asked to make a comment. The most frequent comment by the students was that they had never participated in a teaching process in this way and that they found it interesting and pleasurable to build the figures instead of just seeing the teacher present them. Thus Machado (2005) states that most of the problems of teaching and learning geometry are of didactic and linguistic origin; and Pavanello (1993), explains that some factors related to such difficulties may be related to the lack of interest of students generated by the lack of didactic resources, the lack of interested teachers to use these different teaching resources in order to develop an attractive and quality teaching, which can use new didactic conceptions such as the use of concrete materials or pedagogical games in the development of their didactic practices.

Through this activity, it was possible to verify that the educational potential provided by the constructions of flat figures is very relevant for pedagogical didactic purposes and attractive to establish correlation between the content of the theme to be addressed.

In this stage, the students were also asked to build the flat figures in groups, where they should be painted with the crayons. This type of activity leads the student to make a prior planning of the construction, as it requires knowledge of geometric shapes or polygons and requires motor skills to handle the materials.

The workshop for construction of flat figures, besides dynamics was recreational, motivating and pedagogically attractive, because at various times the groups discussed which polygon would build, because second. Fiorentini and Miorim (1990) “says that behind each material used, a vision of education, mathematics, man and the world is hidden; that is, there is, underlying, a pedagogical proposal that justifies it.”

It is noteworthy that it was possible to observe that the workshop as a didactic process for the activities, through visual resource and experimentation, causes a change in the students’ posture, with a greater motivation and participation of the majority, which represents a greater involvement of the students in relation to the content of geometry, because according to Castelunuovo:

> Concrete must have a dual purpose: "to exercise the synthetic and analytical faculties of the child"; to enable the student to construct a concept from concrete; analytical because, in this process the child manages to discern in the object those elements that constitutes globalization. For this the object has to be mobile, which can undergo a transformation so that the child can identify the operation that is underlying. (CASTELUNUOVO, 1970, p.82-91).

Geometric solids were also made, but before we present some concepts of geometric figures of three acrylic dimensions such as pyramids, prisms, cube, dodecahedron, icosahedron, tetrahedron, octahedron, sphere, cylinder to them, to make a previous planning and only then assemble the solids, but some students had already acquired the concepts of the flat shapes in the previous workshop, because for assembly of solids required knowledge of the flat geometric spaces and requires motor ability to handle the materials , according to some students had never worked with these solids concretely. Cardboard, barbecue stick, contact stick, contact glue, scissors, etc. were used to assemble the geometric solids.

In each constructed figure, the planning of the workshop was used and the relationship of geometric solids with the flat figures was applied, the assemblies were consecutively made, and also analyzed the acrylic forms of model for planning. This pedagogical potential conditionally interacts the students in the constructions of the figures, opening discussion about how to be assembled, was an exercise of patience for the conclusion of these concretes.

We can also use interdisciplinarity in this pedagogical process, because, according to the National Curriculum Parameters (1998-MEC):

> The teacher should be the mediator who encourages the development of procedures that contribute to develop in the student the interest of seeking new horizons and sharing knowledge acquired in different situations. Taking into account this orientation, there is a great need to promote interdisciplinarity and contextualization of disciplines and especially mathematics

That is, to facilitate even more the broad view of objects and their relationships. However, we emphasize that, it can be seen that not all students actually have an overview of the three-dimensional figures and we observed that some of them had doubts yet to assemble one of the forms of a solid. We also found that this type of action prepares the student to seek solutions and at the same time obtains this dynamic process of pedagogical learning to explore the reasoning before the constructions of geometric shapes. We verified that this activity was done with great commitment and participation of the students, however, at some point there was a need to accompany some students in the process of assembling the geometric solids. We've recorded some comments made by them, such as:

- "We think that taking a geometry class through geometric figure constructions learns much more and besides being fun."
- "In addition to learning in theory we can learn better in practice, the teacher is not just passing on the board and it is more interesting to take practical classes."

It is evident the importance of this activity developed in the educational scope, because this didactic transposition shows the reality in the classroom and working with this collaborative activity we verify the importance of sharing together this essential activity in the life of mathematics students and educators.

This pedagogical potential presents actions that can be implemented in the school environment. The experiment and the approximation of geometric theory in their lives contribute to educational activities, leading students to be more interested in learning geometry.

5. FINAL CONSIDERATIONS

The research shows that the incorporation of activities that favor social interaction, cooperation and experimentation in the classroom can make a difference in the school environment, because the social context in which these students are inserted is not isolated from the school, and one of the tasks of the same is to promote an education that enables the social life of the students. Effective collaborative participation is another point that we highlight with the workshops, considering that it was shown to be a positive point, which is reinforced by Lorenzato (2006) when he states that: Teaching is different from teaching. Teaching is giving conditions for the student to build their own knowledge.

We also emphasize that the use of concrete materials in the teaching of geometry in addition to promoting the interaction of students with the object of study and from this interaction they can build their knowledge, also promote discussions in the sense of identifying in this way in the students' daily lives, which shortens the distance of mathematical concepts and their applicability besides being more interesting and meaningful , serving as an alternative for teaching geometry that escapes from the traditional.

It is notepoint that the workshops developed achieved their objectives that started from the development of skills that allow the abstraction of geometric contents, which can be used to understand, describe and represent in an organized way the world in which we live.

It is believed that the research itself is feasible as a working methodology when prepared previously and offers potential for the simplicity presented in its development, thus contributing to the teaching process learning geometry and mathematics.

Therefore, we conclude that the elaborate "educational construction" had a rewarding result, with a lot of interaction we achieved our objectives in the process of teaching and learning mathematics, we hope with this work to be included as a trend in the educational process of students and educators.

REFERENCES

ABNT-ASSOCIAÇÃO BRASILEIRA DE NORMAS TÉCNICAS. NBR 6022: informação e documentação: artigo em publicação periódica científica impressa: apresentação. Rio de Janeiro, 2014. Acesso em 19/03/2012.

ARAÚJO, J.L.; BORBA, M.C. Construindo Pesquisas Coletivamente em Educação Matemática. In: BORBA, M. C.; ARAUJO, J. L. (Org.). *Pesquisa Qualitativa em Educação Matemática*. Belo Horizonte: Autêntica, 2004.

AZEVEDO, Edith D. M. Apresentação do trabalho matemático pelo sistema montessoriano. In: Revista de Educação e Matemática, n. 3, 1979 (p. 26-27).

BRASIL, Ministério de Educação. PARÂMETROS CURRICULARES NACIONAIS – Matemática – 5ª a 8ª séries, 1998, MEC.

CARRAHER, T. N. Na vida dez, na escola zero. São Paulo: Cortez, 1998.

CASTELNUOVO, E. Didática de La Matemática Moderna. México: Ed Trillas, 1970.

FIORENTINI, Darío. MIORIM, Maria Ângela. Uma reflexão sobre o uso de materiais concretos e jogos no ensino da Matemática. Publicado no Boletim SBEM – SP, ano 4 – n° 7.

FIORENTINI, Dario; LORENZATO, Sérgio. Investigação em Educação Matemática: pressupostos teóricos e metodológicos. Campinas, SP: Autores Associados, 2006 (Coleção Formação de Professores). Artigos da Secretaria de educação do estado de São Paulo

GIMENO SACRISTÁN, J. (2000). O currículo: Uma reflexão sobre a prática (3ª Ed.). Porto Alegre: Artmed.

MACHADO, Silvia Dias Alcântara. Aprendizagem em Matemática – Registro de Representação Semiótica, Campinas-SP; Papirus Educação, 2005, p.11-30, p.125-133.

MATEMÁTICA DIVERTIDA/POLIEDRIS. Disponível em: http://pt.wikipedia.org/wiki/S%C3%B3lidos_geom%C3%A9tricos Acesso em 29/05/2012. jan/julho de 1995.

MINISTÉRIO DA EDUCAÇÃO. Lei nº 4.024 de 20 de dezembro de 1961. Lei de Diretrizes e Bases da Educação Nacional. Diário Oficial [da] República Federativa do Brasil, Brasília, DF, 27 dez. 1961

NCTM (1991). Normas profissionais para o ensino da Matemática. Lisboa: Associação de professores de Matemática e Instituo de Inovação Educacional.

PAVANELLO, Regina Maria, O Abandono do Ensino da Geometria no Brasil: Causa e Consequências. Revista ZETETIKÉ – Editorial – ano1 – n.1 – mar. 1993, p. 7-18.

PAVANELLO, Regina Maria, Por Que Ensinar /Aprender Geometria? Universidade Estadual de Maringá.

PORQUE ENSINAR/APRENDER GEOMETRIA? Disponível em: www.sbempaulista.org.br/epem/anais/mesas_redondas/mr21-regina.doc. Revista – Sociedade Brasileira de Educação Matemática. Rio de Janeiro, n. 4, p.3-13,

TAHAN, Malba. Didática da Matemática 1967, p.31.

[1] PhD student in Education at UNR-Argentina, Professor of Mathematics, and Criminal Police of MT.

[2] PhD in Education; specialist in School Management and Person Management; Graduation in English Portuguese/ English and its literature, bachelor’s degree and bachelor’s degree in Physical Education.

[3] PhD student in Education at the National University Of Rosario – Unr, Argentina, Holds a Degree in Letters – English From Castelo Branco College (2006). Law and Philosophy. Specialization In English Language.

[4] PhD student in Education at the National University of Rosario – UNR Argentina. Graduated in Vernacular Letters from UFBA – Federal University of Bahia. He holds a postgraduate degree and curriculum, didactics and evaluation from the State University of Bahia – UNEB, Postgraduate in Methodology of Portuguese Language Teaching and literature from the Regional Faculty of Philosophy, Sciences and Letters of Candeias- Bahia. Spanish language training certified by DUCLE – ARGENTINA. Spanish language and Portuguese language teacher. Manager of the State College Professor Maria Leal Lopes, Nova Ibia – Bahia.

[5] PhD student in Education at the National University of Rosario – UNR Argentina, Bachelor’s degree in Letters. University of the State of Bahia, UNEB and pedagogy by the Regional Faculty of Philosophy, Sciences and Letters of Candeias- Bahia. Professional Master’s degree in Theology. Higher School of Education, EST, Brazil. Specialization in Linguistic and Literary Studies. Federal University of Bahia – UFBA. Specialization in Planning and Management of Sist. Educ. Distance. Bahia State University, UNEB. Specialization in Higher Education Methodology. Integrated Faculties of Ducks – FIP, Specialization in Teaching Methodology for Professional Education, UNEB-BAHIA. Brazil. Spanish language training certified by DUCLE – ARGENTINA.

[6] Graduated in Portuguese and English Letters from UEG, post graduated in higher education teaching, from Ucan Rj; postgraduate in technology in education from Puc Rio de Janeiro and post-graduate in elementary school methodology from UFG. Attending PhD in Education at UNR argentina.

[7] Graduated in Full Degree in Geography from the Catholic University of Salvador. Year 1987. She graduated in Methodology of Geography Teaching. Attending PhD in Education from the National University of Rosario -UNR Argentina.

Sent: July, 2020.

Approved: October, 2020.