

IN THE LINES AND ABOS MUISCAS, THE DAILY LIFE OF THE CLASS OF MATHEMATICS

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Our proposal has as foundation a pedagogic approach (Muiskanoba) learned of the same territory and that it offers the intercultural education in the classroom. The pedagogic proposal Muiskanoba, favorable the recognition, understanding and valuation of the whole territory that makes part of a school institution. In this proposal two strong principles exist to contemplate and to describe. From there it is possible; according to we saw it in our investigation, to achieve the mathematical study of the day-to-dayness of the students. To contemplate not only with the eyes but with each one of the senses, making a systematic "journey" of the territory. To describe as the possibility of communicating the carried out views. However we could not make it with the usual materials, for it we think to take to the classroom others that were characteristic of the territory and then the clay made its appearance in class. With different materials and two spaces, plane and spherical, the class of mathematics was different. Here the description entered. Through her, we propitiate the relationship among students, of students with materials and of students with subject. And this way ancestors arrived to our class, the first residents from Colombia and their cosmovisions. There was in the class a space of communication of ideas of diverse nature, historical, mathematic, social etc. In general lines this it is our experience that we want to share and which knits, theories and materials characteristic of the territory, with educational experience and mathematical education for the interculturalidad.



The Ministry of education of Colombia, with base in the work developed by experts in mathematical education published two lead documents for the educational practice, the limits in mathematics and the standards. In these proposals they are all the areas of the mathematical education that should be covered by the

academic programs of the schools. However teaching of geometry has been relegated to the last contents of the plan of studies mathematic studies and for lack of time, it is little the space that can be dedicated to these classes. We know that to develop all areas of the mathematics in class is very important; therefore we wanted to dedicate this work to the geometry in the classroom.

Our pedagogic proposal was an intervention in the classroom. We denominate it ceramic-pedagogic piece, because it stops us the traveled road went similar to the one that an artist travels in the elaboration of a work. But we also gave him this name for the coherence of the same proposal, which had as base the clay use for the learning of the geometry. The intervention took place in the School San Bernardino Educational Institution Distrital with grade students ninth. The main objective was the characterization of the plane space and the surface of the sphere, with the use of some

lines muisca. This intervention develops it in three phases, speculation, view and description. We take as relating the investigation-learning pedagogy MuisKanoba (Panqueba & Orphan, 2006) which is a pedagogic proposal of education for the interculturalidad. Of the diversity of pedagogies exposed in this proposal we only chose two, the pedagogy of the view and the pedagogy of the description. These pedagogies guided the work in each one of the phases. And each one of the phases was developed in a group of classes.

The work that we carry out in the classroom of mathematics was framed through cultural contexts, those which in spite of not being of general interest inside the legal mark of the mathematical education, they are important for the development of the national unit and of the identity of the students with its culture; we take like reference to the General Law of Education (Law 115 of 1994) that regulates the study and the critical understanding of the national culture in their ends and of the ethnic and cultural diversity of the country.



The Muisca is an indigenous community that inhabits some sectors of the current highland from Cundinamarca and Boyacá in Colombia. They were some of the first residents from Colombia. At the moment there are three small town councils recognized by the national government. One of them is next to the school in which we carry out the investigation. The previous muisca captured their cosmo-visions material several envelopes, as stone, ceramic, wool

and gold among other, to this artistic production call him visual art Muisca. We had the opportunity to know the visual art that they developed in which they included certain geometric objects as point, segment and straight line among others. Once well-known, we take this art for sustenance of our work in the classroom.

During our journey for the one on the way to the realization of the ceramic-pedagogic piece, we observe that the Muisca culture had a vast artistic production. Then we choose some lines of compositions muisca that were carried out many years ago in ceramic of clay. Compositions in which used segments, points, triangles and squares among others. We decomposed them, using them to show the students geometric objects mainly the point, segment and the straight line.



In our walking, besides geometric objects and lines in which contemplate their representations, we carry out an approach to the Muisca culture. We walk for the territory Muisca of Bosa. These journeys carry out them through walks listening the histories of daily lives of those muisca that lived them many years ago, not only revises the history through the books, but also by means of people. We made it this since way the pedagogy of the view it consists on the ritual of to see and to observe, originated of the rituals of Rikuna, to see or to look at the day-to-dayness, without pre-trials neither pre-concepts, this it is a pre-scientific fact of innocent character. Another ritual included in this pedagogy is Ricuyana, to look with attention in a planned way, a scientific fact is considered for that is here where it is made a registration, classification and classification of the view.



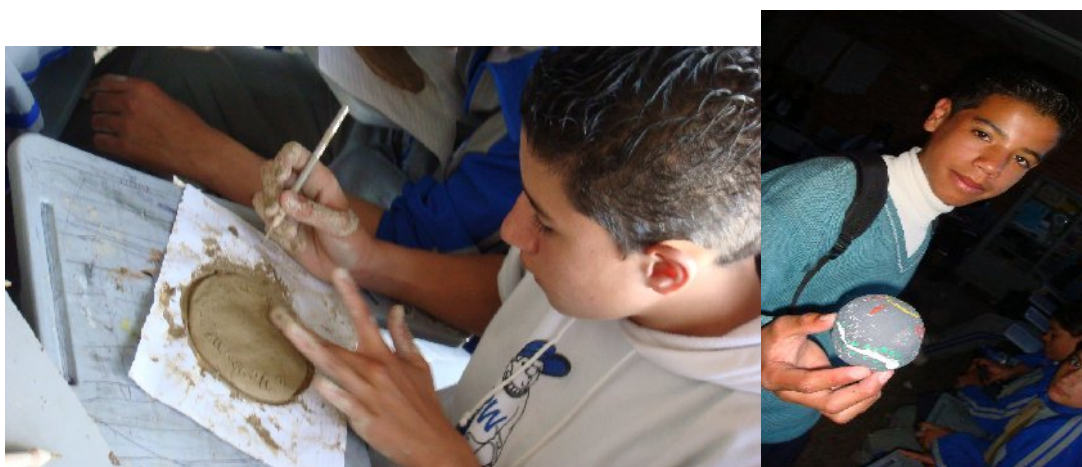
The previous itineración made part of the phases of the speculation and view. We gave ourselves the opportunity to give him a context different to the class of mathematics. It was as well as we undertook walking for the geometry, without leaving in any moment to our muisca far from the class. We wanted to take to the students to contemplate the Muisca art directly in pictograms located in the sector denominaded Rocky Coats of Tequendama, near the city of Bogotá, however it was not possible and we had to appeal to the video. We observe clearly how they lasted to the years to pass our ancestors' cosmo-visions and how they made use of geometric elements that we commonly see in

geometry classes. We also use pieces ceramic muisca, with different lines that showed us other cosmo-visions. In the same way the students represented in clay irons some geometric objects that made part of these same cosmo-visions. We didn't have the opportunity to converse with our students on the meaning of each one of these cosmo-visions or the why they were represented, but this same impediment gave place to our own interpretations and meanings.

After carrying out the views, the students produced their compositions with lines muisca, in which included enough geometric objects. Not only those that initially had planned (straight line, segment and point), they included rhombuses, circles, rectangles, among others. These lines recorded them initially in clay irons, which we use like plane space and then they recorded them in clay Abos. The muisca called Abos to the Great Circle or what is the cosmos and era represented as a sphere in a more up-to-date language.

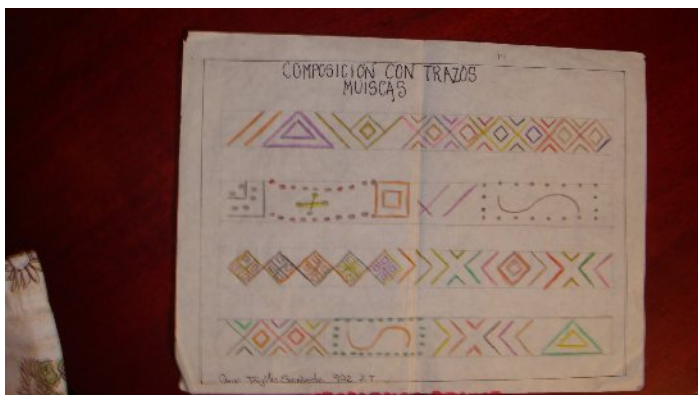


Each one of the compositions of the students was contemplated by their partners. But walking didn't only consist on the view. Each student carried out a description of her lines, as much for the plane space as for the spherical one. It was as well as we undertook the phase of the descriptions. Through visual, written, graphic manifestations, etc., (principles of the pedagogy of the description) they were copied, they created and they re-created the knowledge and knowledge contemplated in the day-to-dayness. We believe that the description should help to think the intercultural relationships, from the ethnic, rural, urban, cultural studies and in general from all the applicable fields to the environment of the education for the interculturalidad.

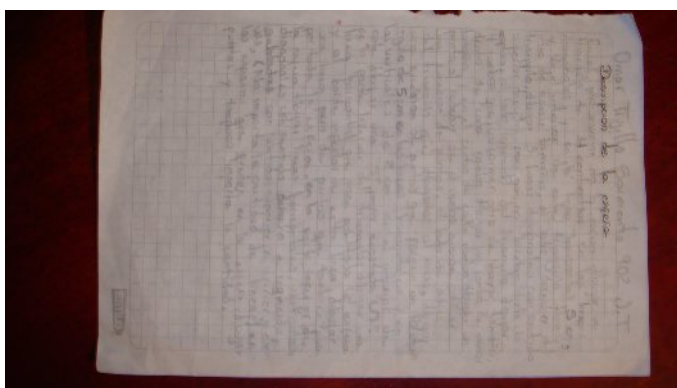


Here he/she went where as much to the students as to us we were hindered the road, because the knowledge, geometric and linguistic, of the students were not very

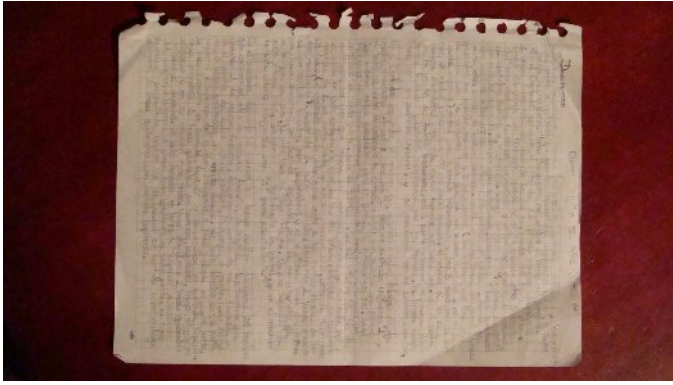
advanced to carry out detailed descriptions and you specify. These difficulties made the students to go to books of text of mathematics and geometry, encyclopedias and until Internet, because through these means they could be informed better to detail each line, and this way to explain what you/they were making better.



When carrying out the descriptions the students they were only centered in their compositions without making reference to the space in which you/they were represented. Then when seeing that it was necessary to name the location of the composition in the space, they used reference points as much of this as of that. But this was only good them for the plane spaces, since in the spherical ones it was not easy to carry out references. For this reason the biggest difficulty was the descriptions of the compositions in the clay Abos, difficulty that it was overcome but not in its entirety, because lack a lot of road to travel. In these descriptions the students gave a cosmopolitan status to their compositions, because besides describing them making use of a geometric language, they wrote their interpretations and meanings, showing a form of seeing the culture Muisca, the current society or the natural elements. By means of this work the students could establish reference points in a space to communicate the position of an object in him. They could recognize and to report the characteristics of the geometric objects that used in their compositions. They differentiated geometric objects starting from the recognition of their properties. And they established some relationships among geometric objects. This is, the descriptions in yes they show a great advance in two senses. First, the recognition and characterization of geometric objects, so much in the plane space as in the spherical one. Second, written production and verbal characteristic of their compositions.



This to walk that we undertook in the students' company to obtain our ceramic-pedagogic piece, it has not concluded, he/she lacks very much to make. The experience gives place to many more inquiry possibilities so much for the one on the way to the mathematical education as for the socio-cultural one.



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