

Contributions of Non-Formal Educational Spaces for the Scientific Literacy of Deaf Students

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Abstract—The school is a social institution that should promote learning situations that remain throughout life. Based on this, the teaching activities promoted in museum spaces can represent an educational strategy that contributes to the learning process in a more meaningful way. This article systematizes a series of elements that guide the use of these spaces for the scientific literacy of deaf students and as experiences of this nature are favorable for the school development through the concept of the circularity. The methodology for the didactic use of these spaces of non-formal education is one of the reflections developed in this study and how such environments can contribute to the learning in the classroom. To develop in the student the idea of association making him create connections with the curricular proposal and notice how the proposed activity is articulated. It is in our interest that the experience lived in the museum be shared collaborating for the construction of a scientific literacy and cultural identity through the research.

Keywords—Accessibility in museums, Brazilian sign language, deaf students, teacher training.

I. INTRODUCTION

WE know that the number of disabled people in Brazil and in the world is not small, but their demographic relevance is not reflected in academic research in the main research centers in the world.

According to Garcia [3] "the other as a problem is the moment of a process. In fact, the other is made. We sculpted the other trait by trace, in a social and daily process: on the basis of madness, we build day-by-day the madman; about the color difference, we make the black; on the difference of the sexes, we make the woman the complementary rib of the man; on the difference of geographic origin, we have converted the stranger [...] And so, from each of them we make a stranger".

In our daily trips, it is common to find deaf, blind people with diverse educational commitments. And when this happens, we generally do not know how to act, because "normality" (bearer of visibility and orality) takes precedence in our subjective constitution. Once invisible, these others cited by Garcia [3] are now with us: in the classroom, in the cafe, on the street, reflected in our mirror and mirrored in decrees.

The school is historically an institution that plays a central role in the formation of students who pass through it, exercising the main access to knowledge. However, education goes beyond the space delimited by school walls and classrooms.

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In the educational field there are three different practices, which occur separately but are not independent of one another, being formal education, informal education and non-formal education.

According to Libâneo [4], we can understand that non-formal education refers to political, professional, scientific, cultural organizations, training agencies for social groups, civic education, etc., with activities of an intentional nature.

Nowadays, there is much talk in interdisciplinarity, the way to join different contents in a single educational project. The important thing is for the school to structure itself, not just doing another walk or excursion, but giving specificity to it, through a pedagogical proposal that aims to develop the pedagogical work to the concrete experience lived through cognitive stimuli.

II. OBJECTIVE

The objectives of this article were to show that the scientific literacy of deaf students in museum spaces is a possibility of social inclusion, enabling an understanding of scientific and cultural concepts of the deaf identity itself and arousing interest in science as a school knowledge. In addition to building a new space for learning, exchange of knowledge and stimulate the appreciation of these spaces of coexistence.

III. JUSTIFICATION

Based on data from the Census of Basic Education according to the INEP (National Institute for Educational Studies and Research), [9] shows a 47.6% increase in the number of deaf students enrolled in regular primary education between 2008 (12.109) and 2012 (17.872). And although there are many students who drop out over the years, that is, high school dropout rates, in high school growth rose 80.2% in the same period, rising from 2.199 to 3.964. In undergraduate courses, enrollees also had an increase of 4.3% according to the Census of Higher Education.

According to the 1948 Declaration of Human Rights [14], article 37 states: "Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to participate in scientific progress and the benefits that result".

It is fundamental that in this participation in cultural life in society work is conducted collaboratively between teachers and students in the construction of a project of common interest in the school. In this proposal the teacher assumes a position of mentoring causing the students to develop the critical sense.

One of the concepts that guided this research was the circularity proposed by researcher Martin [6]. The idea that

the outside world can be a source of knowledge is that each one learns in his own way building knowledge about it, much applies in the proposal that the museum spaces are also educational environments.

Students should participate in the discussions, develop research through generative themes, make posters about intercultural and interdisciplinary themes, and carry out a previous survey of the knowledge about the project that will be taught, in order to guide them, prepare them for visitation, as well as promoting curiosity about the subject. In this way, they do not reach the museum without any knowledge and can enjoy, know and learn in a more autonomous way.

According to Lewis [5], "Museums preserve world cultural property and interpret it to the public. [...] It is part of the natural and cultural heritage of the world and may be of a tangible or intangible nature. Often, the cultural good provides also the primary reference in various subjects of the area, such as archeology and natural sciences, and therefore represents an important contribution to knowledge. It is also a significant component in the definition of cultural identity at national and international level" [5]. In this way, it is reflecting on the rule of law of these students with disabilities that the free access to the culture of humanity is guaranteed and preserved.

IV. METHODOLOGY

The methodology applied was exploratory field research, observing, collecting, analyzing and interpreting the facts through a bibliographical review and data collection.

In this research project was developed a relationship between the museums located in the city of São Paulo (Brazil) and other institutions located in Paris, Versailles and Rome.

In the visited institutions, issues related to accessibility for deaf visitors were observed, and how the structure provided could contribute to teachers in the classroom.

Non-formal education institutions, such as museum spaces, have great potential for the teaching-learning relationship, and being connected to school units can represent an important relationship between theory and practice of a system that cognitive acquisition of knowledge.

The collected data were analyzed according to the following criteria: A) Does the space have didactic material for deaf visitors? B) Does the space provide translators? C) Are there deaf educators in space? D) What space uses the sign language? E) Does the space have data on how many disabled people visit the institution annually? F) Of those who are deaf? G) Does the space have an educational proposal aimed at deaf visitors? H) Does the space have partnerships with schools and universities? I) What are the main institutional challenges for the care of people with disabilities?

Some of the data still needs to be investigated and discussed in more depth. This work is part of a master's dissertation that will be completed in 2018, but some considerations may already be reported.

V. PROCESS DESCRIPTION

We developed an interdisciplinary activity in the classroom

with the objective that the students understood the historical period of the Renaissance through the discipline of History in partnership with the disciplines of Mathematics, Physics and Arts. This activity was organized in the state school Dom João Maria Ogno, located in the city of São Paulo in Brazil. It was proposed by Professor Rafael and had the support of teachers Márcia, Mayra, Carlos and Julio all of the 1st year of high school and the students were Bianca, Katiele and Pamela.

Initially we verified the previous knowledge of these students and through activities in the classroom, realized that there was limited knowledge about this important phase in the history of humanity.

We organized a visit to the Museum of Cultural Center of Brazil where he was receiving the exhibition "The Masters of the Renaissance - Italian Works".

The exhibition contained more than 50 masterpieces from important Italian collections, both public and private. An extraordinary opportunity that our students had to study the richness of Italian art at the time of its apogee known as the Renaissance.

Works such as paintings, sculptures and drawings were selected with the intention of presenting to its visitors, the course of the Renaissance movement throughout Italy through the works of Rafael Sanzio, Botticelli, Michelangelo and others. This initiative was an excellent opportunity for the students to know in practice the contents taught by the teaching staff in the classroom.

As the students are deaf, the space made available the presence of a deaf educator and also had the contribution of Professor Rafael Dias Silva. As the teacher is bilingual, her main function was to stimulate the pupils during the exposition by establishing connections with the content previously taught in the classroom.

An important point to note is that the 17-year-old female students have never had access to a museum in their lives.

After the exhibition we carried out evaluative activities on the subject and the students presented an acquisition of this content in a satisfactory way.

The images indicated below were the day of the visit to the Bank of Brazil Cultural Center.



Fig. 1 Students: Bianca and Katiele-Banco do Brasil Cultural Center [1]



Fig. 2 Students: Bianca, Pamela, Katiele and teacher Rafael - Bank do Brazil Cultural Center [1]



Fig. 3 Educational material for deaf visitors - Museum of Orsay - Paris – France [7]



Fig. 4 Palace of Versailles - Versailles – France [11]



Fig. 5 National Institute for the Deaf Youth of Paris - Paris – France [8]

VI. CONCLUSION

Scientific literacy facilitates the reader's reading of the world in which he lives, and the deaf subjects are able to perform the same reading, since we are talking about human beings with only different physical characteristics.

After the students have visited the museum and

demonstrated the acquisition of knowledge in a satisfactory way, we can say that the environments of non-formal education have an enormous capacity to contribute to teaching learning, that is, museums become instruments of social reflection.

According to SIMAM [12] "The museum is a peculiar educational environment. It has a collection of selected records of socio-historical experience. It has, after all, materiality and opportunities for symbolization not found in school. And it is from an education to look through this materiality (dispersed, contradictory, lacunar and plural) that its educating role, its peculiarity and its potentiality is realized.

As a future teaching professional, the shortage of bilingual teaching materials aimed at the deaf community is not only for the discipline of science, but for all the disciplines that make up the school curriculum of basic education and higher education, it is a challenge to overcome in the next years in Brazilian education.

The development of bilingual educational strategies and didactic materials can constitute and promote a better viability in the learning of certain contents collaborating for the scientific literacy of the deaf students [13].

The school should prepare the deaf child or listener to come into society, providing conditions for the scientific literacy of this student allowing their participation, reflection and a de facto inclusion in society.

The good services provided to visitors in the spaces studied in this project, such as the Palace of Versailles [11], the Musée d'Orsay [7], the Vatican Museum [15], the National Institute of Deaf Youth in Paris, the Lasar Segall Museum, the Banco do Brasil Cultural Center and the National Museum of Natural History Paris [10], reduce the levels of possible discontent with this didactic modality, helping the visitor to create opportunities for learning and entertaining.

The idea is to guarantee all visitors, with or without disabilities, the same quality of attention through the collections and spaces available in museums.

Through this research, deaf visitors demonstrated a preference for an interpreter made available on the day of visitation, and the deaf are not always able to do lip reading. This was verified in the Brazilian Sign Language, French Sign Language, Italian Sign Language and American Sign Language, since the Vatican Museum uses this language.

Science, according to Chassot [2], is "a language to facilitate our reading of the natural world" and scientific literacy can be considered as one of the dimensions to enhance alternatives that favor a more committed education.

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Rafael Dias Silva is a teacher, master's and researcher in special education. He has created the LIBRAS (Brazilian Sign Language) in Science, Habits - USP | Leste project, lectures on inclusion in the public sector, initial and continuing training courses for teachers on bilingual education (LIBRAS / PORTUGUESE), as well as on methodology and educational strategies.

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