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SEMEARTE AND THE INCREASE IN SCHOOL INCOME IN THE PERCEPTION OF STUDENTS

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Abstract: The study aimed to probe the results of the use of art incremented by technological resources in the teaching of Natural Sciences, at Colégio Brigadeiro Newton Braga (CBNB), of the Federal Public Network belonging to the Air Force. To do so, he drew parallels between his classes in the 9th grade of Elementary School. On the one hand, the regular classes and on the other hand, the classes with low school performance and with behavioral problems. In these so-called special classes, differentiated work is recommended, without much demand for content, which allowed us to resort to art and new technologies in their various forms of manifestation, as pedagogical instruments that enhance greater freedom of expression and richer dialogue between knowledge, basic points for building a humanizing and, therefore, inclusive education. At the end of two years, when evaluating the results of this work, obtained from answers to a semi-open questionnaire applied to the students, we verified that the academic performance of special classes, unlike the others, always showed significant growth curves of increase in relative School Performance. This indicator of success was extracted from a quantitative analysis by comparing percentages and having been qualitatively corroborated by the speeches of students who expressed satisfaction and praise for this differentiated way of teaching Natural Sciences. The increase in the School Performance of these classes echoes scholars who defend the rapprochement between science, art and new technologies (GASPARETTO, 2014; MATOS, 2003). This way, the present work contributed to the enrichment of school teaching, making it more accessible and attractive and, above all, an instrument of enchanting students with Natural Sciences and the universe of Art through new technologies, which brought them closer to school, leveraging

their socialization and their school and social inclusion.

Keywords: Art, new technologies, school performance.

INTRODUCTION

The teaching work always presents, both for the student and for the teacher, several opportunities for discovering the other and oneself, in a process of collective construction. This construction involves teaching-learning from the perspective of approximation and dialogue between the different areas of knowledge of the exact sciences, in which reason prevails, and the arts, in which emotion prevails. As a teacher at Colégio Brigadeiro Newton Braga (CBNB) of the Federal Public Network belonging to the Air Force, located in Rio de Janeiro, I work in Physics, one of the components of the Natural Sciences discipline, in the 9th year of Elementary School. This text reports a challenging experience, assumed and lived, and its results at CBNB, based on students' perceptions, involving an interdisciplinary pedagogical project, which we call SEMEARTE. SEMEARTE postulates the idea that Science, Art and New Technologies can merge in order to transform teaching-learning into a pleasant task for students and teachers. SEMEARTE is an offshoot of the Public Policies for Education Technologies project, developed from 2011 to 2013 at the Espaço Laboratory of the Institute of Research and Urban and Regional Planning at ``Universidade Federal do Rio de Janeiro`` (LabEspaço /IPPUR/UFRJ), coordinated by Professor Tamara Tania Cohen Egler. From the formalization of the partnership between CBNB and LabEspaço /IPPUR/UFRJ, in 2018, SEMEARTE has improved, intensifying the use of new technologies at CBNB, within precepts aligned with issues of sustainability and the contextualization of the student as an attentive and zealous citizen with the

space in which you live. This fusion, present in SEMEARTE, increasingly pressing in the contemporary world, yields more valuable results in education committed to school and social inclusion. SEMEARTE's commitment to education presupposes freedom of expression, valuing the identities of school actors within their diversities and contradictions, and positioning the student as the protagonist of the entire school process.

In the pursuit of performance improvement, CBNB, like other Public Schools, has been classifying and separating students by learning performance and behavioral aspects for years. For example, I mention the classes of the 9th grade of elementary school (901, 902, 903, 904 and 905), with which I worked in the academic years of 2016 and 2017. These classes, like all other classes in other grades, are classified in descending order of performance, from class 901 to 905. Classes 905 are made up of more problematic students, many of whom are under threat of retirement, and others who have health problems and various types of reports doctors. It is recommended that teachers in these classes, as an attempt to include these students, include alternative and innovative pedagogical activities in their teaching practices with a differentiated charge for content, extracurricular themes and extracurricular activities.

SEMEARTE's activities, always respecting the demands of the classes, took place in two ways: the first consisted of the use of background music and sounds of nature at various times during the classes during normal (regular) hours and also during after school (optional support classes) and, the second, the elaboration of extracurricular works, with extracurricular themes in the interface with other disciplines and always having artistic and technological languages as a background, with students as protagonists. We also seek to encourage this student to participate in the

school's biggest event: the Culture Fair. This event takes place in the last quarter of each school year, culminating in the presentations of works prepared throughout the year by the various classes, grades and disciplines of the school. The Culture Fair, according to the understanding of its organizers, is institutionally legitimized by the CBNB and opens up space for student freedom of expression, which certainly concerns the use of art and its various alternative languages. The presentations of works at Culture Fairs, such as models, drawings, recited and sung soirées, dances and small theater performances, are opportunities to awaken students' interest in science and the arts. We visualize here a way for the so-called exact subjects to rethink greater freedom of expression and the establishment of a more dynamic and fruitful dialogue with knowledge from other areas. This is the heart of the present work and the starting point on the journey towards the much-publicized interdisciplinarity defended by thinkers directly or indirectly linked to education who focus on the search for ways to enrich knowledge in general in the various academic areas and human activities (EGLER, 2014; FAZENDA, 1991 and 1999; MORIN, 2000; PIAGET, 1973). Art, in any of its manifestations, has great potential to contribute to this rethinking. Art is productive, creative and emancipatory, fundamental conditions in the teaching-learning process without which education does not materialize in its greater sense of humanization (ALVES, 1995; EGLER, 2014; FREIRE, 1995). Like no other form of language, the artistic reserves us, especially when enhanced by technological resources, real possibilities for building new, more enriching paths for the school study of science, opening spaces for dialogue between science and other curricular components (GASPARETTO, 2014).

The aim of this research is to contribute

positively to school performance, consisting of an increase in learning, attendance/punctuality; behavior (discipline); interest/participation; the perception of the importance of school studies and the satisfaction in apprehending them (MATOS, 2003). We also aim to bring teachers and students together and encourage their protagonism and the development of their ecological awareness and their care for nature as a whole, the greatest good of humanity (BOFF, 2010).

METHODOLOGY

Based on authorization granted in 2015 by the General Director of CBNB, Luiz Otávio Ebendinger Martins, this research was carried out, in the academic years of 2016 and 2017, with the help of interns from the disciplines of Nature Sciences and Arts, together with students from the classes of the 9th grade of elementary school. Over that time, the purpose of the work was to make a comparison between classes 901; 902; 903 and 904 with classes 905, said to be special, for having greater learning and behavior problems, which participated in SEMEARTE. Comparisons were possible, on the one hand, through objective data, obtained through notes of quarterly tests, on science, applied with a value from zero to ten and, also, through the attendance/punctuality of students in each class, in percentages from zero to one hundred percent. On the other hand, comparisons were possible through subjective data, contained in the answers to the optional questionnaire and without student identification (Figure 1), provided at the end of each of the quarterly tests, so that the student, anonymously, had the opportunity to express perceptions learned during science class. Numerical values and/or written representations about the behavior (discipline) of the class, about interest and participation during classes, about satisfaction and the importance given to science in school

teaching. Thus, the research in question is characterized as mixed since it reveals objective information (scores obtained in the tests and percentages of attendance/punctuality) and at the same time reveals subjective information (perceptions of students about their class) and these work with meanings, beliefs, values and attitudes (LUDKE & ANDRÉ, 1996) which enriches and diversifies the deeper analysis of the student's relationships with the class and, consequently, with the school. The search for this diversity was motivated by the best way to establish a relationship between the use of art and changes in the scenario in the results of teaching work in science teaching.

Reply and comment if necessary:

- 1) Question 1: Evaluate from zero to 100 the level of good behavior (discipline) of the class in Science (Physics).
Response:%
- 2) Question 2: Evaluate from zero to 100 the level of interest/participation of the class in Science (Physics).
Response:%;
- 3) Question 3: Rate from zero to 100 the level of importance given by the class to Science (Physics) in school teaching.
Response:%;
- 4) Question 4: Evaluate from zero to 100 the level of satisfaction of the class in studying Science (Physics) this year.
Response:%

Figure 1 - Optional questionnaire without student identification provided at the end of each quarterly test

RESULTS

We now present results that involve objective aspects such as the average grades of all students, by class, in 2016 and 2017 (Table 1) and average attendance/punctuality percentages of all students, by class, in 2016 and 2017 (Table 2). Both Tables, in general, show, with regard to classes 901, 902, 903 and 904, in the two school years, small oscillations, sometimes with an increase, sometimes with a decrease in the averages, but always maintaining regularity. On the other hand, with regard to the 905 classes, in the two

academic years, we can see a constant growth in averages, from the first to the third quarter.

As for the subjective aspects, we now present results, referring to the academic years of 2016 and 2017, which involve students' perceptions about their class in Natural Sciences classes regarding behavior (discipline) (Table 3), interest/participation (Table 4), the importance given to this subject (Table 5) and the degree of satisfaction in these classes (Table 6). The Tables, in general, show, with regard to classes 901, 902, 903 and 904, in the two school years, small oscillations, sometimes with an increase, sometimes with a decrease in the averages, but always maintaining regularity. With regard to the 905 classes, we see, in Table 3, a significant and constant growth, from the first to the third quarter and greater in the year 2017; in Tables 4, 5 and 6 the growth was constant and more accentuated in the third quarter.

Regarding the opportunity for the student to make comments through the questionnaire, we recorded, as it is of interest to the present study, only the comments of class 905 that refer to the pedagogical work that they experienced, which associates art and new technologies with the teaching of Science. Thus, approximately 75% of the 2016 students and approximately 85% of the 2017 students made positive comments, most of the time praising this work.

We present, below, some of the most expressive statements that can contribute to a better understanding of what was summarized numerically in Tables 1 to 6:

"I did a lot of research on the internet and found many interesting sites. We learn to study and do tasks more easily... It's pure travel. Time goes by so fast and you don't get tired. Why does it only happen in Science and Art like this?";

"Participating in rehearsals for the Culture Fair was a lot of fun, we played instruments,

sang, danced and did theater. So the class learned more and behaved better and everyone liked Science and Art classes and almost never missed it.";

"The biggest cost is the inverted classroom. We passed on to the people in the room what we learned in the videos watched in the classroom. It must be like that in general and the students would stop messing around, skipping class and would learn more.";

"The classes with music and the freedom to use the cell phone and the computer, that was all fun, I loved it... We felt at home, with all due respect. I have never learned so much in such a short time.";

"I was happy to improve a lot at the College. Art teaching Science and Technology; Science teaching Technology and Art; Technology teaching Science and Art. It cost!";

"Great! Classes with interactive games, videos, internet, cell phone without prohibition. This year Science and Art did well. It was unforgettable. "

DISCUSSION

The results point to the great potential that we have in schools, for human material that is sensitive to novelties and willing to leverage works that make use of artistic languages and new technologies as valuable instruments for improving the students' academic performance. I am referring here to the interns who supported the operational part of applying the tests, the questionnaires and collecting data on students' attendance and punctuality. It is also worth emphasizing that our students understood the proposal developed and brought us elements that helped us to argue in defense of the systematic and institutionalized use of art in school activities.

As the results gathered in six tables show, in general, the 905 classes, the so-called special classes with which we carry

classes	2016			2017		
	1st quarter _	2nd Quarter _	3rd Quarter _	1st quarter _	2nd Quarter _	3rd Quarter _
901	9.0	9.3	9.0	8.8	9.3	9.0
902	8.5	9.0	8.8	9.0	9.3	8.8
903	6.8	6.5	6.3	7.0	6.5	6.0
904	6.0	5.3	6.0	6.3	5.3	6.0
905	5.5	6.3	7.3	6.0	6.5	7.8

Table 1 - Average test scores in Natural Sciences

classes	2016			2017		
	1st quarter _	2nd Quarter _	3rd Quarter _	1st quarter _	2nd Quarter _	3rd Quarter _
901	88%	98%	90%	93%	95%	93%
902	93%	90%	88%	95%	90%	90%
903	83%	78%	65%	80%	75%	70%
904	66%	58%	60%	65%	60%	65%
905	65%	75%	88%	63%	78%	90%

Table 2 - Assessment of attendance/punctuality (in percentages)

classes	2016			2017		
	1st quarter _	2nd Quarter _	3rd Quarter _	1st quarter _	2nd Quarter _	3rd Quarter _
901	90%	93%	88%	95%	90%	93%
902	93%	98%	95%	95%	93%	90%
903	85%	83%	80%	78%	80%	75%
904	50%	55%	50%	53%	50%	58%
905	48%	75%	93%	53%	70%	95%

Table 3 - Assessment of class behavior in Natural Sciences

classes	2016			2017		
	1st Quarter _	2nd Quarter _	3rd Quarter _	1st quarter _	2nd Quarter _	3rd Quarter _
901	93%	85%	80%	90%	93%	90%
902	95%	95%	93%	90%	95%	93%
903	75%	70%	73%	70%	78%	73%
904	60%	63%	55%	63%	50%	55%
905	55%	70%	90%	63%	73%	93%

Table 4 - Assessment of class interest/participation in Natural Sciences

classes	2016			2017		
	1st quarter _	2nd Quarter _	3rd Quarter _	1st quarter _	2nd Quarter _	3rd Quarter _
901	90%	88%	93%	95%	90%	93%
902	93%	98%	93%	90%	95%	93%
903	70%	73%	70%	70%	75%	68%
904	50%	53%	45%	53%	50%	48%
905	60%	63%	80%	65%	70%	90%

Table 5 - Assessment of the importance given by the class to Natural Sciences

classes	2016			2017		
	1st quarter _	2nd Quarter _	3rd Quarter _	1st quarter _	2nd Quarter _	3rd Quarter _
901	90%	88%	93%	95%	90%	90%
902	88%	93%	85%	85%	90%	88%
903	65%	65%	55%	68%	70%	60%
904	50%	58%	55%	53%	45%	40%
905	55%	68%	90%	60%	70%	95%

Table 6 - Assessment of class satisfaction in studying Natural Sciences

out differentiated work using artistic and technological languages, during classes and in the preparation and presentation of works at Culture Fairs, unlike the other classes, showed constant signs of improvement in School Performance over the quarters, in the 2016 and 2017 school years.

With regard to Table 1, what matters and what sets the 905 classes apart from the other classes is not the total grades, as other classes had better averages. The same occurs with regard to Table 2 regarding attendance/punctuality. What really matters is the advantage of the 905 classes over the others in relation to the growth curve and the constant evolution of the grade averages as well as the attendance/punctuality related to the Natural Sciences curricular component.

Regarding Tables 3, 4; 5 and 6, as in the previous tables, what is relevant for class 905 is not the total percentages, as other classes have better averages. What really matters is the advantage of the 905 classes over the others in terms of the growth curve and the constant evolution of these averages. This scenario that portrays students' perceptions reinforces the relationship between the improvement of grades and behavior in Science and the differentiated work of this class.

The comparisons made between the 9th grade classes reveal an indication of the success of the school rescue of the students of the 905th class, with art favoring the stimulus to school inclusion through intrinsic motivation, as scholars tell us who, in short, defend the power

of emotion as a the most powerful lever in the learning process (ALVES, 1995; BOFF, 2010). The power of emotion that emanates from art expands spaces for cognitive and, mainly, conative development. Art is an element of creation and, as such, capable of helping build self-knowledge, which implies strengthening self-esteem and autonomy, assumptions of an inclusive education (FREIRE, 1999; PIAGET, 1973). Consequently, the work with the 905 classes achieved its goal by encouraging its students to self-sociability and self-inclusion in school and society.

CONCLUSION

The rapprochement between science and art, a plausible manifestation of the process of reconnection of human knowledge, an urgent challenge for the present and, even more, for the future, makes possible, as in no other situation, the dialogue between reason and emotion. Thus, among the different types of knowledge that circulate within the different areas of human knowledge, art is the starting point for the construction of a truly interdisciplinary education (MATOS, 2003; MORIN, 2002).

The speeches and the objective results presented in the tables that summarize quantitative information converged to the idea that there is a healthy and productive relationship between art and science teaching. This data reinforces the thinking of those who still believe that it is possible to find alternative ways to increase School Performance and,

consequently, the school and social inclusion of our students. Therefore, these results need to be widely discussed within schools and by extramural educational planning bodies.

We think that the school assumes its humanizing and inclusive role as it positions itself towards greater freedom of expression and the establishment of more dynamic and fruitful artistic and dialogic practices within the school space, a utopia capable of

promoting the enrichment of school teaching. This way, the present work contributed to the enrichment of teaching, making it more accessible and attractive and, above all, an instrument of enchantment of students by Natural Sciences and the universe of art, which brought them closer to school, leveraging their socialization and their school and social inclusion.

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