The influence of the brazilian public school math olympiad on the basic education development index: an analysis in the municipality of Coruripe-alagoas

A influência da olimpíada brasileira de matemática das escolas públicas no índice de desenvolvimento da educação básica: uma análise no município de Coruripe-alagoas

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ABSTRACT
This article aims to analyze the influence of the Brazilian Mathematics Olympiad for Public and Private Schools (OBMEP) on the Basic Education Index (IDEB) in a municipality of Alagoas in the period from 2007 to 2017. It was developed from the collection and analysis of data through interviews and semi-structured questionnaires prepared by the proponents themselves, and directed to the coordinators of the aforementioned municipality, in order to analyze the influence of the Brazilian Mathematics Olympiad for Public Schools on the IDEB results. Based on the data obtained, it was clear that since the insertion of programs aimed at improving student performance in the OBMEP, the results of the IDEB of the municipality were also improved, reaching 6.3 points in 2017, which means an increase of 1.9 points compared to 2015.

Key-words: Brazilian Public School Mathematics Olympiad, Basic Education Development Index, Influences.

1 INTRODUCTION

The research and extension programs offered by CAPES directed to the university (PIBID, Pedagogical Residency), the internships during the undergraduate course, the experiences in the field, the studies directed to POLYA (1977) and the OBMEP, are all part of the mainspring that motivated the development of this research.

The interest in this theme arises from the knowledge of studies by some theorists at the university, especially POLYA (1977), and his studies with emphasis on problem solving. From then on, we sought to understand their strategies in the application of questions found in the

OBMEP exams, leading to reflections on the relevance and the main role of the OBMEP in mathematics education. Because it is a valuable tool, whose main bias is centered on problem solving and on contextualizing the teaching of mathematics, we sought to analyze its influence on the improvement of mathematics teaching in the municipality of Coruripe-AL. The choice of this municipality is due to the fact that it has presented high rates of awards in the OBMEP since 2005, the period of its implementation, as well as in the IDEB, where it stands out among the other municipalities of Alagoas.

To measure the quality of Brazilian education, the Brazilian Index of Education Development (IDEB) was implemented in 2007 by INEP.

Data from the IDEB of the municipality of Coruripe indicate a significant growth between the years 2007, to the last result of 2017 published in the year 2018 (QEDU, 2919). In another survey conducted with data from the OBMEP having as research subject this same municipality of Alagoas, it was possible to verify an increase in the number of medals and honorable mentions during the annual editions (OBMEP, 2019).

This study aims to analyze the influence of the OBMEP in the IDEB of the municipality of Coruripe-AL, considering the significant increase in the number of awards and in IDEB results in the period from 2007 to 2017. From this, it is also intended to point out the relevance of strategies and studies aimed at better results in the OBMEP, and how these studies end up reflecting positively on the IDEB results. This research leads us to investigate how much the Brazilian Public School Mathematics Olympiad has influenced this growth in the aforementioned period. To this end, a qualitative-quantitative exploratory study will be conducted based on a survey of data from the final years of elementary school in the municipal school system of the aforementioned municipality.

2 MATHEMATICAL OLYMPIADS

2.1 WHAT IS A MATHEMATICAL OLYMPIAD?

When referring to the Olympics, it is important to mention the Greek Olympic games, source of inspiration for the emergence of the mathematics Olympics, which brings in its range, disputes organized in modalities in which athletes compete among themselves in order to obtain winners, and finally receive their due awards (Rubio, 2010).

Maciel (2009) explains that mathematical competitions have been organized for a long time, since the mid-sixteenth century, being famous for the challenges in which important mathematicians pledged their reputation, reasonable amounts of money and even their

professorships at major universities. Such challenges gave competitors performance and prominence for solving highly complex challenges.

> A Mathematical Olympiad is characterized by a sequence of tests, composed of challenging problems, which uses mathematics to obtain the solution. In most of the tests, of the various existing competitions, the problems that make them up do not require the student high mathematical knowledge, but the ability to interpret, create and improvise as quickly as possible (BAGATINI, 2010, p.12).

The mathematics olympics arise with the purpose of improving the quality of mathematics teaching, arousing the students' interest in studying, also influencing the taste for mathematical problems, enriching and stimulating studies in the area.

3 THE BRAZILIAN MATHEMATICS OLYMPIAD FOR PUBLIC AND PRIVATE SCHOOLS (OBMEP)

The Brazilian Mathematics Olympiad for Public and Private Schools - OBMEP - is a national project aimed at Brazilian public and private schools, with the inclusion of private institutions in its 13th edition in 2017, organized by the National Institute of Pure and Applied Mathematics - IMPA and the Brazilian Mathematics Society - SBM, and sponsored by the Federal Government.

Created in 2005, its main goals are to awaken students' interest in mathematics and identify talents in the area:

> Stimulate and promote the study of mathematics; contribute to improving the quality of basic education, enabling a greater number of Brazilian students to have access to quality teaching material; identify young talent and encourage their entry into universities, in scientific and technological areas; encourage the improvement of public school teachers, contributing to their professional development; contribute to the integration of Brazilian schools with public universities, research institutes and scientific societies and promote social inclusion through the dissemination of knowledge (OBMEP REGULATION, 2019).

It is important to note that the OBMEP was presented to the school community and to Brazilian society as a project of social and scientific inclusion inspired by the NUMERATIZAR Project developed in the state of Ceará in 2003, which aimed at developing strategies that would improve the quality of Math teaching in Basic Education, as "discovering, disclosing and improving the talents of our youth is the most effective and fastest way of social inclusion". (NUMERATIZE PROJECT, n. d.). Just as in the Numerate Project, the OBMEP is divided into levels.

OBMEP is aimed at students from the 6th grade of elementary school to the last year of high school, from municipal, state, and federal public schools, and private schools, as well as their respective teachers, schools, and education secretariats, all located in Brazil. It is divided into two phases. The first phase: application of an objective test (multiple choice) to all students registered by the schools, and the second phase: application of a discursive test to the students selected by the schools for the second phase, according to the classification criteria.

Students participating in OBMEP are divided into three (3) levels, according to their level of schooling. Level 1 includes one (1) students enrolled in 6th or 7th grade of elementary school, level 2 (two) students enrolled in 8th or 9th grade of elementary school, and level 3 (three) students enrolled in any grade of high school.

In its 14th edition in 2018, 54,498 schools participated in the OBMEP, in which 18,237,996 students were enrolled in the first phase. In the 2nd phase, 50,183 schools from all over the country participated in the Olympiad, with 952,782 students taking part.

At the time of the OBMEP awards (medals, honorable mentions and scientific initiation scholarships) the students with the best scores in the second phase are rewarded, standing out among the other participants and generating motivation and interest in mathematics. The students who win medals are offered the opportunity to participate in the Jr. Scientific Initiation Program (PIC Jr - OBMEP), which consists of introducing the student to interesting mathematical content and questions.

The Jr. Scientific Initiation Program (PIC) provides the winning students in each edition with the opportunity to enter a bank of interesting mathematical questions, expanding their knowledge and preparing them for professional and academic entry. The student will have two options regarding classes, the PIC in face-to-face or virtual format. OBMEP provides students with a virtual forum where, with the help of moderators, they can perform tasks in addition to the classes. The objectives of the PIC are based on the regulations:

> To awaken in the students a taste for mathematics and science in general; to motivate the students in their professional choice for careers in science and technology; to deepen the mathematical knowledge of the students by solving and writing solutions to problems, reading and interpreting mathematical texts and studying topics in a deeper way and with greater mathematical rigor; to develop in the students some abilities such as: systematization, generalization, analogy and ability to learn on their own or in collaboration with other colleagues; encourage the mathematical improvement of teachers, especially the teachers of the scholarship students and Stimulate an articulation between schools and universities (OBMEP, 2019).

Regarding the participation of students in the PIC Jr. in the municipality of Coruripe, the program has 20 students participating until the recent year 2019, contributing to a greater learning

in the area of mathematics, which has reflected positively in the school environment and in the student's daily lives.

In addition to the PIC, there is also available to students the Mentors Program, which aims to assist PIC students and offer the study of advanced content in different areas, and the availability of courses taught by university professors on specific topics.

In 2018, the OBMEP LEVEL A was launched for the first time, held by the Instituto Matemática Pura e Aplicada (IMPA) with support from the Brazilian Mathematics Society (SBM), the Ministry of Science, Technology, Innovations and Communications (MCTIC) and the Ministry of Education (MEC), aimed at 4th and 5th grade students enrolled in Brazilian municipal, state and federal public schools with the purpose of revealing talent earlier, strengthening and pursuing excellence for the area of mathematics.

4 OBMEP'S PERFORMANCE AND OBJECTIVES IN BASIC EDUCATION

Since its implementation, OBMEP has played a very important role in the teaching of mathematics, promoting significant changes in public schools in the country, stimulating the study of mathematics through challenging problems, filled with strategies and logical reasoning, awakening the interest of students and teachers through the contextualization and resolution of problems found in their exams, thus modifying and contributing positively to the teaching and learning process.

In its organizational structure are challenging questions and a range of teaching materials, as well as a virtual platform for the study and deepening of mathematics, with programs aimed at preparing students. The benefits and support programs, especially the PIC Jr and the OBMEP at school, have raised an increasing interest of students and teachers, directing them to expand their mathematical knowledge. In this sense, Biondi (2012, p. 04) states that:

> "OBMEP influences the quality of public education, increasing the average mathematics score of schools in Prova Brasil [...]".

According to the research conducted by Biondi (2012) OBMEP is a significant tool in the learning of mathematics in public schools, also contributing to a greater depth of mathematical knowledge of teachers, reflecting positively in the lives of students who will be one of the main targets.

5 BASIC EDUCATION DEVELOPMENT INDEX

The Basic Education Development Index (IDEB), originated in 2007 by INEP (National Institute for Educational Study and Research Anísio Teixeira), is seen as an indicator that encompasses two important features for the quality of education: school flow and the performance averages in the evaluations. The IDEB also makes it possible to improve educational policy with a view to quality and the advancement of education in the country. According to Fernandes (2007), the IDEB is an objective indicator that seeks to assign values from 0 to 10 to Brazil's education systems based on the combination of two factors: flow and learning.

According to the Ministry of Education, the IDEB:

> The Ideb works as a national indicator that enables the population to monitor the quality of Education through concrete data, with which society can mobilize in search of improvements (MEC, 2009).

Working on the targets set since 2005, on a scale of 0 to 10, the goal is that in 2021, Brazil reaches a score of 6.0, to be at the level of the OECD (Organization for Economic Cooperation and Development), which is a supranational organ based in Paris, which brings together the world's most economical countries. The OECD is responsible for applying the Programme for International Student Assessment, PISA, which takes place every three years, with a sample of 15 to 16-year-old students from public and private schools.

Data from the latest PISA report in 2019, Brazil ranked 73rd in mathematics in the placement among the 79 countries that participated in the assessment in the areas of Science, Portuguese and Mathematics. In the 2018 edition, more than 13,000 Brazilian students participated in which the results will be released in the year 2019. These allow the comparison of student performance and the learning environment between different nations. The objective of this evaluation is to produce indicators that contribute to the discussion of the quality of education in the participating countries.

According to Fernandes (2007), an ideal teaching model:

> [...] would be one in which all children and adolescents have access to school, do not waste time repeating grades, do not abandon their studies early, and, at the end of it all, learn. (FERNANDES, 2007).

To increase the quality of education and reach the established goals, INEP developed six indicators according to the country's reality, first released in 2002: (1) Socio-demographic context; (2) Supply conditions; (3) Access to and participation in education; (4) Efficiency and school performance; (5) School performance; (6) Financing and spending on education. According to the

United Nations Organization of States (UNESCO) and the Organization for Economic Cooperation and Development (OECD), these are some of the factors that influence the quality and performance of a country's education.

Based on this, IDEB is based on the performance of the Prova Brasil (Brazil Exam) and the Sistema de Avaliação da Educação Básica - SAEB (Basic Education Evaluation System), which are carried out in the final years of elementary school I (1st to 5th grade) and elementary school II (6th to 9th grade).

6 THE CALCULATION OF IDEB

IDEB is calculated by means of the product of two factors, the learning performance in the Portuguese and Mathematics subjects obtained in the Brazil Exam, and the performance, defined as flow, the school or system's approval rate, obtained in the School Census, that is:

IDEB = Performance x Yield

According to the IDEB 2019 Technical Brief, the calculation of IDEB:

> [...] obeys a formula in which the scores of the Portuguese and Mathematics tests are standardized on a scale of 0.0 (zero) to 10.0 (ten), then, the average of these two scores is multiplied by the average (harmonic) approval rates of the grades of the stage (early years, final years and high school), which, in percentage, ranges from 0 (zero) to 100 (one hundred). (INEP/MEC, 2021).

As the IDEB average is on a scale of 0 to 10, multiplication by 10 is necessary, and is also used to assign grades for school work. To define the Learning Rate (Performance), just use the following algorithm:

$$\text{PERFORMANCE (D)} = \frac{\text{PROFICIENCIA NA PROVA BRASIL} - \text{LIMITE INFERIOR DAS PROFICIÊNCIAS}}{\text{LIMITE SUPERIOR} - \text{LIMITE INFERIOR}}$$

Table 01- Upper and Lower Limits of Standardization

Series/Year	Mathematics		Portuguese	
	Lower	Superior	Lower	Superior
5th Year	60	322	49	324
9th Grade	100	400	100	400

SOURCE: IDEB Technical Note (INEP, 2009)

The lower and upper limits, are values presented in table 1, situated 3 standard deviations above and below the average proficiency of all students who took the 1997 Saeb, the year in which the scale was defined.

To illustrate, we will use data from a school X of a certain year of elementary school in the final years. This municipality managed to obtain the averages 243.25 and 249.51, respectively, in Portuguese and Mathematics in the final years of elementary school according to the results of Prova Brasil. The performance in Portuguese is calculated:

$$D_{Port} = \frac{243,25-100}{400-100}$$
$$D_{Port} = \frac{143,25}{300}$$
$$D_{Port} = 0,477$$

Performance in Mathematics

$$D_{Mat} = \frac{249,51-100}{400-100}$$
$$D_{Mat} = \frac{149,51}{300}$$
$$D_{Mat} = 0,498$$

Now all you have to do is average the two performances.

$$PERFORMANCE = \frac{0,477+0,498}{2}$$
$$PERFORMANCE = \frac{0,975}{2}$$
$$PERFORMANCE = 0.488$$

The performance, or pass flow, is done at the end of each year by means of the school census. If there is no transfer or death, it is placed over three categories, Pass, Fail and Dropout. Approved students are those who, at the end of the school year, have met all the performance and attendance requirements, according to the school's regulations. Those who have failed are the students who have not met the required conditions, such as performance and/or attendance, according to the school unit's legislation. The dropouts are those who left the school during the school year, having their enrollment cancelled.

The performance rate is defined as the ratio between the number of students who pass and the sum of students in the three categories. The performance indicator used in IDEB is the number of school years that a typical school student spends to complete a grade. In a situation where there are neither failures nor dropouts, this value would naturally be one, that is, only one school year would be spent to complete each school year. Mathematically, the number of school years it takes for a student to complete each grade is given by the inverse of the pass rate for the respective grade.

Continuing our demonstration with the same school and considering the final years of elementary school, we built Table 02 to present the calculation of the yield.

Table 02 - IDEB Performance Calculation

	6th grade	7th grade	8th grade	9th grade
Approval % Rate	88,3	89,5	90,5	95,0
Pass Rate (decimal)	0,883	0,895	0,905	0,95
Years of study required to complete grade	1,13	1,11	1,10	1,05

SOURCE: QEdu (2019a)

Considering that the pass rate in the 6th grade was 0.883, it takes 1/0.883 = 1.13 years for a regular student to complete his first year in the final years. Applying this algorithm to the rest of the following school years, we have the values shown in the last row of Table 02.

To find out how many school years are needed to complete elementary school, 6th through 9th grade, just add up the four school years, (1.13 + 1.11 + 1.10 + 1.05 = 4.39), that is, it will take 4.39 years to complete the final years of elementary school.

Therefore, the performance indicator is the result of dividing the number of grade/year by the number of school years to complete the stage. In the case shown, the Yield is:

$$INCOME = \frac{4}{4,39}$$
$$YIELD = 0.91$$

To get this school's IDEB, simply product the PERFORMANCE by the INCOME and by 10.

$$IDEB = 0.488 \times 0.91 \times 10$$
$$IDEB = 4.44$$

7 METHODOLOGY

The research was carried out in the municipality of Coruripe-AL, through the municipal secretary of education. The starting point of the research is centered on the analysis of the data survey of the IDEB of the aforementioned municipality and its prominence among the other municipalities of Alagoas when it comes to OBMEP awards, leading us to analyze the existing relationship between OBMEP/IDEB. In order to analyze the influences of the Brazilian Mathematics Olympiad for Public and Private Schools (OBMEP) on the Basic Education Development Index (IDEB), the work was developed based on research and information provided by the general coordinator of projects, the coordinator responsible for monitoring the IDEB and the secretary of education of the municipality.

The present work was based on the survey and analysis of data found on the OBMEP and INEP websites and on a semi-structured questionnaire. This was applied on May 14, 2019 and was composed of ten open and closed questions, presented in printed material. The questionnaire contained questions regarding the coordinators' education, time in the job, experience in the position, continuing education for the teaching staff, student performance, the tools that contributed to the IDEB, the programs directed to Prova Brasil, the programs directed to OBMEP, and, finally, the existing relationship between OBMEP and IDEB. According to Moreira and Caleffe (2006) there are some advantages in the use of questionnaires because they provide an efficient use of time, guarantee anonymity for the target audience, the return is guaranteed most of the time, and the questions follow a pattern.

In addition to the questionnaire, information was extracted from the municipal secretary of education and other coordinators responsible for monitoring the school performance of institutions in the municipal education network. The research made it possible to understand the vision of these professionals about the influences of the OBMEP on IDEB, and how this work has been developed over the years, leading the municipality to stand out in the awards table and consequently in the IDEB in the state of Alagoas.

8 RESULTS AND DISCUSSION

Throughout the evaluations of the Basic Education Development Index (IDEB), the state of Alagoas, in the final grades of elementary school in the public network, managed to reach the goal proposed by INEP only in 03 (three) years, as shown in the table below.

Table 03: IDEB - Alagoas/Projected Goals

YEAR	IDEB	GOAL
2005	-	2,3
2007	2,6	2,3
2009	2,7	2,5
2011	2,6	2,7
2013	2,8	3,2
2015	3,2	3,5
2017	3,9	3,8

Source: INEP (2019b)

The state of Alagoas, in 2017, had 36,552 students enrolled in the final grade of elementary school in the public school system; in this same year, 85% of these students participated in the Prova Brasil. As can be seen in detail below, little more than 10% learned what is considered adequate for the final grade of elementary school.

Table 04: Proficiency Levels of the Evaluated

Discipline	Advanced	Proficient	Basic	Insufficient
Portuguese Language	3%	21%	56%	20%
Mathematics	1%	9%	51%	39%

Source: QEdu (2019c)

Analyzing the above table, it can be seen that most students in Alagoas are at the basic and insufficient levels. About 70% of the students are at these two levels in Portuguese, and more than 90% are also at these levels in Mathematics. A comparison with the other states of the federation shows that Alagoas had low levels when it comes to the Prova Brasil.

In contrast to these data, it can be observed that the municipality of Coruripe, with a total of 17 (seventeen) elementary schools, has excelled, achieving significant results over the years in relation to other municipalities in the state when it comes to the municipal average IDEB. For a better analysis, let us see the following table:

Table 05: Coruripe's IDEB 8th Grade/9th Grade Results - Projected Goals

Year	Ideb	Goal
2005	2,7	-
2007	3,1	2,7
2009	3,9	2,9
2011	3,3	3,1
2013	3,8	3,5
2015	4,4	3,9
2017	6,3	4,7

Source: INEP (2019)

According to the table above we can analyze a continuous growth in the IDEB score since its implementation, in the last score the municipality obtained an increase of 1.9 points, surpassing the projected score for 2021, which would be 4.7.

In 2011 the municipality was awarded the first gold medal in the OBMEP (see Table 07), and since then the awarding rates have grown significantly throughout the OBMEP editions. Let's look at the following tables that deal with the awards in levels 1 and 2 of the OBMEP, since the research is aimed at Primary II, the intention is to analyze the number of medals in levels 01 and 02.

Table 6: OBMEP Level 1 Awards - Coruripe - AL

Year	Honorable Mention	Bronze	Silver	Gold
2005	4	-	-	-
2006	-	-	-	-
2007	1	-	-	-
2008	1	-	-	-
2009	-	1	-	-
2010	-	-	-	-
2011	-	-	-	-
2012	4	-	-	-
2013	12	3	-	-
2014	8	4	-	-
2015	12	8	-	-
2016	12	4	-	-
2017	8	9	-	-
2018	14	5	-	-

Source: OBMEP (2019a)

Given the data exposed in the table above, it stands out the significant increase in the number of awards in the period from 2012 to 2018, if it is only about Level 01.

Table 07: OBMEP Level 2 Awards - Coruripe - AL

Year	Honorable Mention	Bronze	Silver	Gold
2005	7	-	-	-
2006	2	-	-	-
2007	1	-	-	-
2008	-	-	-	-
2009	-	-	-	-
2010	1	2	-	-

2011	-	1	-	1
2012	2	-	-	-
2013	3	2	-	-
2014	12	2	-	-
2015	9	2	-	-
2016	21	3	-	-
2017	15	4	1	-
2018	13	4	-	-

Source: OBEMP (2019b)

As for Level 02, the awards are more significant as of 2011, the year in which the municipality received its first Gold medal, until the 14th edition of the OBMEP, receiving a large number of Honorable Mentions and Bronze Medals. By graphing the OBMEP awards and comparing the performance of the municipality of Coruripe in the IDEB, we analyze that from the significant growth in the number of awards in the OBMEP, the municipality has presented significant results in the IDEB throughout the editions until the 2017 edition. According to studies by Soares and Candian (2011), by preparing to perform well in the OBMEP, students improve their performance in the classroom.

Figure 01: Evolution of IDEB indexes/ OBMEP Awards Level 01 and 02
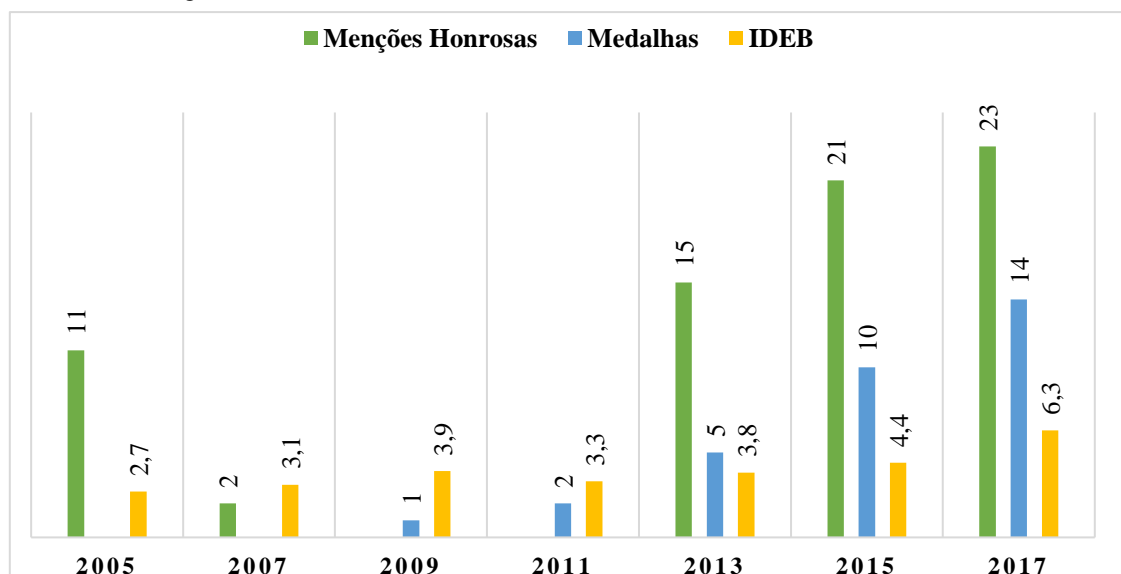
Source: (INEP, 2019d x OBMEP)

Chart 01 shows the evolution of IDEB in the municipality of Coruripe and the growth in the number of OBMEP awards.

From the graph it is possible to note that since 2011, there has been an increase in the number of awards and in the IDEB indexes, exceeding the projected targets during the aforementioned period. It is important to add that in 2014 the municipality of Coruripe adopted training programs for the OBMEP, such as the Olympic Training Intensive Pole (POTI), in which

it offers classes aimed at improving the performance of students from 6th to 9th grade of elementary school and students enrolled in any grade of high school in the Olympics OBMEP and OBM through funding of on-site classes in poles , OBMEP in School, whose purpose is to contribute to the training of mathematics teachers from state and municipal public schools, encouraging more in-depth studies and the adoption of new teaching practices in the classroom.

According to the coordinator's conception, "the students who attend the training sessions aimed at OBMEP show excellent results in the classroom, ensuring a sure approval".

The graph above shows that in 2015 there was an increase in the number of awards in the Olympiad and, consequently, in the IDEB index. In that same year, the municipality was awarded 21 Honorable Mentions and 10 medals, and in 2017, this number increased to 23 Honorable Mentions and 14 medals. We analyzed the period from 2015 to 2017, due to the fact that the training began in 2015, in anticipation of significant results in the following years.

In view of these data, as well as analyses of the IDEB indexes, the prominence of Coruripe in relation to other municipalities in the state is verified. Thus, some questions arise in the face of this overview. How to explain that the municipality of Coruripe has achieved good results in Prova Brasil? Regarding the increase in the number of awards in the OBMEP, is there any influence of the OBMEP on the municipality's IDEB? Through the interview conducted with the managers, the intent is to show that the research data are consistent with the answers obtained according to the following questions mentioned above.

For the coordinator, "after the gold medal, the entire management, from the secretary to the teachers, were motivated to work harder so that all schools could achieve awards, thus reflecting on the students' performance and learning in the classroom, and contributing to the growth of the IDEB in our municipality.

Through the semi-structured interview with the coordinator, it can be seen that the IDEB has advanced positively due to the monitoring of the educational institutions and the projects adopted by the Secretary of Education of the Municipality (SEMED), such as pedagogical monitoring in Portuguese and Mathematics, training for the OBMEP, continuing education for teachers and attractions directed at sports. In addition, partnerships with foundations, such as the Lemann Foundation, which is an entity active in the field of education, one of whose goals is to carry out a series of actions aimed at innovation, management, educational policies, and the formation of a network of young talent, and institutes focused on education, played a key role in the educational process, contributing positively to these results.

From the coordinator's perspective, "the work focused on OBMEP has influenced us to participate not only in the OBMEP, but also in other Olympics such as the Math Kangaroo, the municipal ones, and we always get awards. Our students stand out through the existing projects and reinforcements.

In addition to the work done by the educational management and the entire school community, it is important to highlight the incentive for teachers proposed by the education department itself, in which awards are given to these professionals who are of great importance in the teaching/learning process and consequently in the IDEB. Moreover, over the years the students who stood out have also had the opportunity to be awarded for their school development, which has led to a greater engagement and motivation in the environment. The good relationship among all contributes to successful practices (LIBÂNEO et.al., 2012, p. 251-252).

9 CONCLUDING REMARKS

This article presented an approach to the influence of the Brazilian Public and Private Schools Mathematics Olympiad (OBMEP) on the Basic Education Index (IDEB). The studies carried out demonstrate the real importance of the relationship between the OBMEP and the IDEB. Thus, it is necessary to go back to the starting point of this research and focus on its objective, which was to analyze how much the OBMEP has influenced the IDEB of the municipality of Coruripe.

We analyze that the work adopted by the municipality and the strategies developed and directed to the IDEB and the OBMEP itself had positive effects on the educational process and, consequently, on the averages of the educational indices. It can also be seen that with the greater engagement of students participating in OBMEP-targeted programs, there is an expressive result in school performance, also reflected in the increase of the IDEB averages. Recognizing the fundamental value of the OBMEP in the educational process is of great importance, which has demystified the teaching of mathematics through the challenging problems found in the tests and a greater contextualization of mathematical content.

Moreover, the inclusion of the Olympiad has contributed to a greater involvement and deepening of mathematics education professionals, modifying and innovating their teaching practices, contributing to the teaching and learning process, generating results in the school context, and later, in the averages achieved in Prova Brasil.

Thus, the study shows that there is influence of the OBMEP in the IDEB, causing a constant and significant growth in the indexes referring to education in Coruripe/AL. Through the data

presented we can see the performance of managers, teachers and students engaged in the preparation for the OBMEP. Furthermore, by analyzing the educational work plan of the municipality, one can notice a concern with the OBMEP, adhering to preparation projects, professional qualification of teachers and pedagogical monitoring, which is reflected in the index published every two years.

And, therefore, the municipality has been standing out both in IDEB and in OBMEP among the other municipalities in the state of Alagoas, as was presented in the paper, being a model when it comes to projects and pedagogical monitoring in mathematics.

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