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Students graduate of the degree course in Natural Sciences and Mathematics and the exercise of teaching profession: findings and implications for basic education

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Abstract: In the article we seek to address questions regarding the interest of graduates of a degree course in Natural Sciences and Mathematics in relation to the teaching career in basic education. The course enables its graduates to work in the subjects Science and Mathematics in the final years of elementary school and Mathematics, Physics and Chemistry in high school. Our intention is to identify and reflect on the perceptions of these graduates about teaching, highlighting with this inherent aspects to the exercise of this profession in basic education. From the application of questionnaires to graduates of this course, we produced data regarding their performance in basic education, which enabled us to reflect on the national scenario in relation to the exercise of this profession. We could observe that the majority of the students participating in the research are not working in basic education and that the current scenario of devaluation of the teaching career exerts a significant influence in the decision making process of choosing or not the teacher profession for professional performance after graduation.

Keywords: Teaching; Basic education; Professional performance, Teacher training.

Introduction

The concern of scholars regarding education in Brazil is notorious. Political uncertainties directly influence educational policies, and result in discussions about the teaching profession.

In this sense, teacher education has been problematized, as well as inherent issues have gained prominence. In this scenario, problems related to the teaching profession, such as the lack of teachers, as well as the low demand for undergraduate courses gain evidence..

This work aimed to understand the relationship between the graduates of the Degree in Natural Sciences and Mathematics (LCNM) from Federal University of Mato Grosso - University Campus of Sinop, with the exercise of the teaching profession. First sought information if they worked in basic education. Subsequently, they were diagnosed as to the time of professional practice, the educational network they worked and their respective feelings of professional achievement.

For those who did not teach, they were asked what their profession was and why they were not teaching. Our main aim was to problematize the teaching profession, taking into account Gatti et al (2009), who reported concerns about attracting and keeping teachers in the teaching profession,

considering that the demand for this profession has been decreasing.

Questionnaires for 98 graduates (total of 100% of the graduates up to the 2015/2 semester) were applied, with 64 answers (65.3% of the graduates) returned. It is noteworthy that this course trains science and mathematics teachers to work in the final years of elementary school and mathematics, physics or chemistry to work in high school.

Nationwide studies are important for the implementation of more effective public policies for education, but local studies better demonstrate the attractiveness of the teaching profession. Thus, research on the exercise of the teaching profession will be presented and, later, we will focus on the situation of graduates of the course in question.

The teaching profession in Brazil: from unattractiveness to devaluation

At times scholars pointed out the problems with the teaching profession in Brazil, which is unattractive. Its devaluation is mainly due to the social and economic issue.

For Diniz-Pereira (2011) there are already signs and evidence of a profound crisis in the teaching profession in Brazil for a long time,

however, “the responses of Brazilian rulers to this situation have been, as a rule, insufficient, mistaken and ineffective” (DINIZ-PEREIRA, p. 36, 2011). For the author, there is a crisis of teaching professional identity, and “being an educator does not constitute, for most young people, an option for professional life” (DINIZ-PEREIRA, 2011, p. 46).

This has resulted in a lack of specifically trained professionals to work in teaching, especially in areas related to science and math education, as reported by Trevisan and Mello (2017), reflecting the 2015 school census data.:

It is noteworthy that the number of teachers, who according to the census, teach classes in subjects for which they are not trained, in this case either have higher education in related areas or do not have higher education. On average this number is 38.7%. But when we look at the areas related to Science and Mathematics Education, according to the 2015 census, we have the following scenario: 68.7% of teachers who teach physics do not have a degree in physics (highest percentage among all subjects). In Sciences this number is 59.9%, in Mathematics 51.3% and Chemistry 46.3%. Biology concentrates the best rate in all subjects, with 21.6% being the percentage of teachers who teach Biology without having a degree in Biology. These numbers indicate that the areas related to Science and Mathematics Education have a big challenge ahead. (TREVISAN; MELLO, 2017, p. 576)

According to the media there was a “blackout” of teachers in Brazil, judging by the data presented above. Pinto (2014) asked: “Are there enough teachers lacking or just looking for other better paid activities?” (PINTO, 2014, p. 04).

According to this author's demonstration, if all the vacancies that were offered for teacher training in the last decade were filled and successful completion, there would be a surplus of teachers in Brazil. Moreover, there was evidence that the public higher education system would cope with the accumulated demand for teacher education, not being necessary the distance learning degrees, which the author classified as irresponsible. (PINTO, 2014).

Pinto (2014) stated that it is no use expanding vacancies in undergraduate degrees without a salary appreciation policy, which according to the author, would be far from happening in Brazil. According to the author, there is a direct correlation between the appreciation of the teaching profession and the salaries paid to these professionals.

Therefore, the teaching profession is not on the rise, which requires more effort to solve this problem. Quality education necessarily entails well-qualified and valued teachers.

It must be considered that the claim of better wages and better working conditions, as well as the maintenance of the acquired rights in the teaching career are legitimate. However, disrespect for this profession is recurrent. Masson (2017) highlighted the use of violence to contain teachers' claims. The author reported that this resulted in demotivation, triggered illness and even the abandonment of the teaching profession. It is noteworthy that this has a negative impact on new generations, who “are less and less interested in entering the teaching career” (MASSON, 2017, p. 851).

The choice of a profession stems from several factors and this is no different with the teacher. Gatti et al (2009) reported that it should be taken into account that:

(...)changes in the labor market, and their relation to the required vocational training, and the social representations of the professions, associated with status and salary, are factors that certainly influence the attractiveness for choosing between different areas of work. (GATTI et al, 2009, p. 10).

The author emphasized that the discussions about the attractiveness of the teaching career should consider the contradictions evidenced by research on “being a teacher”, and these contradictions oscillate between satisfaction and frustrations, between choice and necessity (GATTI et al, 2009).

In Brazil, teacher appreciation is mentioned in the speeches of many rulers, however, in practice there is professional devaluation. In addition, many schools have precarious working conditions and many teachers do not receive a salary floor, which has long been established by law, but is still lower than other professions that require compatible training.

It should also be considered that “the teacher's work is becoming increasingly complex and demanding more and more responsibility” (GATTI, 2009, p. 12). Combining the salary, social devaluation and the teacher's working conditions in many Brazilian schools, it can be stated that training a teacher and keeping him in basic education has become a major challenge, which should be considered by educational public policies.

In the following, we will discuss the local reality from perceptions of graduates of the degree course in Natural Sciences and Mathematics, which can provide an overview of teacher education in the northern region of Mato Grosso.

The experience in the teaching profession from perceptions of graduates of a degree course

An online questionnaire was sent to the graduates of this course that will be formed between the semesters 2010/1 to 2015/2, totaling 98 graduates in the three qualifications (Mathematics, Physics and Chemistry). 64 questionnaires were

returned. 27 from Mathematics, 16 from Physics and 21 from Chemistry. The questionnaire was directed to gather information about the teaching profession. The questions were expressed below:.

Table 1: Questions concerning the exercise of the teaching profession

Are you working in basic education?
<p>If yes:</p> <p>1) How long have you been working in basic education?</p> <p>2) Education network in which it is acting.</p> <p>3) Do you feel fulfilled today working in basic education? Why?</p>
<p>If no:</p> <p>1) Have you ever worked in basic education?</p> <p>• <i>If you answer No to question 1:</i> Why never worked in education?</p> <p>• <i>If yes to question 1:</i> How much time? Why not continue in teaching?</p>

Source: Prepared by the authors

The questions aimed to problematize the profession of teacher and gear data that could give an overview of the situation.

Regarding whether they were working in basic education or not, 27 (42%) were working in basic education. It is noteworthy that of the 37 (58%) who are not working in basic education, 6 were working in higher education.

Of those who were working in basic education, 5 (18.5%) were younger than 1 year, 12 (44.5%) were working between 1 and 3 years and 9 (33.3%) were teaching more than 3 years. of which 1 did not answer about the time of work. Regarding the school system, most worked in the state school system, 19 (70.4%) belonging exclusively to this school system; 2 (7.4%) to the state and private systems together; 1 (3.7%) to the state and municipal systems together; 1 to the municipal system only; 3 (11.1%) only the private network and 1 did not answer this question.

Regarding the level of achievement in working in basic education, most said they did not feel fulfilled, totaling 59%, another 33% said they were satisfied and 8% chose not to respond.

Among the justifications for not being professionally performed were listed: the social and financial devaluation (37%); school with bad structural conditions (26%); situations concerning students and family members (19%); difficulties encountered in the education system (11%); no answer (7%). The answers can be more than one answer group.

Some answers were presented in Chart 2 to illustrate the positions of the research participants. Feelings of discouragement and lack of professional fulfillment, due to social and financial devaluation, are perceived. The National Education Plan Observatory (OPNE), coordinated by the Everyone

for Education Movement, pointed out that “although the appreciation of education professionals is given special prominence in the National Education Plan and of particular relevance to society, Brazil is far from reach this goal and meet this challenge ” (OPNE, 2017, p. 48). On the other hand, there are those who still believe in a better future for education in Brazil. The educational system in Mato Grosso is another point raised, both in reference to the physical structure of schools and the question of the organization and functioning of elementary education in Mato Grosso, as well as the condition of non-failure..

The physical structure of schools in the municipality of Sinop is poor, according to our opinion during the supervision of supervised internships of undergraduate students. Most of them need general reform, but what has been done are palliative reforms or minor repairs made by the principals of the school units themselves.

Also, Sinop has a shortage of school buildings, and some schools operate in rented buildings, precariously, and there is no definition of construction of definitive buildings. “The municipality has 18 state schools, 11 state-owned buildings, four provided by the city, and three buildings are rented by the government. Of these, seven buildings are in poor condition”¹ (news published by the G1 News Portal of Mato Grosso, on 23/01/2015).

This scenario resulted in teacher demotivation, according to the answers of our questionnaires.

Among respondents were those with the chosen profession and the most recurrent justifications were about being noble the act of teaching and being able to make a difference in one's life. There were also those who claimed to have the feeling of being respected by the school community, such as egress R56, who works in the private school system in the municipality of Sinop.

Among those who did not work in basic education were those who have ever worked (n = 15), and also those who have never taught (n = 21). One respondent did not answer whether he was working in basic education or not.

Among those who have worked in basic education, 67% worked less than 1 year; 20% worked from 1 to 2 years; 6% from 2 to 3 years and 7% worked over 3 years. The most common justification for leaving school is that they were civil servants or obtained opportunities with better pay and satisfaction, as in the case of working in higher education. Gatti et al (2009) pointed out that: “there is a growing demand for public service careers in which, once admitted to the competition, the candidate has stability in this service guaranteed by law”.

¹ Source: <http://g1.globo.com/mato-grosso/noticia/2015/01/escolas-publicas-de-sinop-mt-estao-ha-8-anos-sem-reforma.html> accessed on 29/08/2017.

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Among those who have never worked in basic education, the most frequent justification is the lack of interest in the profession (33%), followed by the justification that he was a civil servant in another area and / or because he works in a private company (19%), together with the fact that you are awaiting a competition or selection in your area (19%). They also justified being graduate students (14%), as well as seeking training (5%), because of the financial factor (5%) and for not being able to work in schools (5%).

Table 2: Some answers from graduates about professional discontent²

<p>Question addressed Due to the social and financial devaluation of the profession</p> <p>Examples of answers <i>No. I graduated from another course and intend to get out of education. <u>Teacher is very undervalued</u> (R34)</i></p> <p><i>No. <u>The instability in the teaching career, the salary inconsistency, the structural difficulties of the schools and the pedagogical bureaucracies make me want to work in another area every day</u> (R13).</i></p> <p><i>No. <u>First, because of salary and structure of existing schools. According to the disregard with which we teachers are today seen throughout society, where inside a classroom we are not seen as examples to be followed, but on the contrary, we are often seen as examples not to be followed.</u> (R53)</i></p>
<p>Question addressed School structure issues</p> <p>Examples of answers <i>No. I have no resources and no time to teach a class that I consider to be of quality. My students deserve more than I have given them. <u>I have 40 students in a classless structure. The government doesn't value me as a professional and some students also</u> (R35)</i></p> <p><i>Not least because the structure leaves something to be desired. (R7)</i></p>
<p>Question addressed Student and / or family questions</p> <p>Examples of answers <i>It could be more fulfilled, as education in our country could be better, we have many difficulties, as there are many students in the same classroom, in addition to the disciplinary difficulty on the part of the students and the <u>lack of responsibility of the students to participate in the activities</u>. I heard I was not going to present the proposed work because I was a child and I couldn't do it (the other 25 students did, and besides, they were 16-year-olds and no longer children). There are numerous situations that put the teacher responsible for everything that goes wrong such as students' non-commitment and lack of attention and learning difficulty, but when the results are positive it is only the student's merit, very fair (R16)</i></p> <p><i>No, <u>because both students' attitudes towards their teaching and the state's attitude towards the problems that must be solved do not make the school environment motivating.</u> (R5)</i></p> <p><i>It's a difficult question from the point of view that I like to be a teacher, <u>but not students, the state and parents either ... the devaluation is absurd and unprecedented. Today entering a room generates indifference...</u>(R40)</i></p>
<p>Question addressed Education system issues</p> <p>Examples of answers <i>No. <u>The public education system is still very flawed, many changes that occurred about five years ago only made the situation of public education in the country worse.</u> (R24)</i></p> <p><i>No, there are many discrepancies that occur in the school process, <u>the whole system works in decay and with no prospect of improvement</u>, sad to experience illiterate students being pushed year after year, children with no prospect of a better future, schools without infrastructure, without pedagogical support. , without support from families, and discouragement to the education professional. But I still have hope and I believe in the strength of teachers (R26)</i></p>
<p>Question addressed No answer or undefined answer</p> <p>Examples of answers <i><u>Sometimes yes and sometimes no. I like to see student progress. From the beginning of the year until the end the student's development is perceived, but there are discouraging situations, such as the lack of respect, the violence within the classroom, the lack of interest of some students and the neglect of some families in helping on student intellectual development.</u>(R60)</i></p>

Source: Prepared by the authors from the questionnaires answered.

² Using the letter R followed by a number identifies the research participant. The letter R refers to the word respondent and the number indicates the order in which replies were received..

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Table 3: Some answers regarding the feeling of professional accomplishment

Yes. <i>I love the information you have in the classroom</i> (R31)
Yes, despite being a poorly valued profession, I am still proud to be a teacher, I like the role of mediator of knowledge, and I enjoy it when I realize that I am making a difference in my students' lives. (R61)
Yes. <i>I have always sought this profession and today I do not regret it. It is very interesting to participate in the student learning process</i> (R36)
Yes, although I entered the course due to lack of choice, today I take the profession of teacher as my life, I remained in education for the sake of the profession, even with all the problems that one faces in daily life and the scrapping of education, still I believe I can contribute to the change of perspective of my students, I still believe that I can influence and bring emancipation to the young and adults who pass through my classes so that they have more opportunity for growth. I feel happy, and mission accomplished when I get back one, thank you, from those who passed through my classes and somehow had their growth. (R44)
Yes, I can pass a little that I learned. (R37)
Yes, because I am respected by my peers, students and parents. (R56)

Source: Prepared by the authors from the questionnaires answered.

Table 4: Some answers about not working in basic education

<p>Question addressed For lack of interest in the profession</p> <p>Examples of answers <i>I lost interest. I don't feel motivated to pursue my career anymore...</i> (R28)</p> <p><i>For lack of interest in the area, because working with children and adolescents is exhausting and does not pay well. The financial offer was more rewarding in the administrative area, so much so that I started a business administration course at Unemat to acquire more knowledge in the area, which I intend to specialize in.</i> (R21)</p>
<p>Question addressed Are you a public servant in another area or work in private companies</p> <p>Examples of answers <i>Before I finished university I was approved in the Post Office Contest</i> (R20)</p> <p><i>I'm in another area</i> (R52)</p>
<p>Question addressed Is approved as a public servant and / or selection in the area</p> <p>Examples of answers <i>There has been no contest since 2009, I can't risk quitting my job and being laid off the other year, or running out of salary in January</i> (R15)</p> <p><i>Awaiting contest</i> (R1)</p>
<p>Question addressed Perform postgraduate</p> <p>Examples of answers <i>Leaving graduation I went straight to the master's degree. At the end of my master's degree I worked at Unemat and started my <u>doctorate</u>. I haven't worked in basic education yet, but I don't rule out the possibility</i> (R10)</p> <p><i>I started graduate school after graduating, I have not worked yet due to the exclusive dedication that CAPES / CNPq requires from scholarship holders!</i> (R4)</p>
<p>Question addressed For the financial matter</p> <p>Examples of answers <i>Because of the low salary</i> (R30)</p>
<p>Question addressed Unable to service in schools</p> <p>Examples of answers <i>So far, the schools in Cuiabá have not called me to teach either state or private</i> (R38)</p>
<p>Question addressed It is seeking training</p> <p>Examples of answers <i>Because I keep seeking training</i> (R64)</p>

Source: Questionnaires answered

Araújo and Vianna (2011, p. 821) reported that it is not difficult to find graduates who do not wish to work in basic education. The authors explained that: "Competitions, masters and other

undergraduate courses are becoming escape routes that graduates have to escape the bad conditions found in the Basic Education classrooms."

It is noteworthy that professional devaluation influences the decision whether or not to choose teaching. It is also noteworthy that the lack of competition in education, ie the lack of financial stability is a factor to be considered. Another highlight is the appreciation of higher education, for some basic education is not even considered, however, there are also those who see it as a future possibility. We highlight the fact that an egress is interested in working, but has not got the opportunity yet.

It was noteworthy that he could not get work (reply from R38). This graduate finished his mathematics qualification course in 2014/2. This lack of opportunity generated reflections, which signaled to an isolated situation, and did not represent a scenario of saturation of the math teachers labor market.

Other studies, such as Araújo and Vianna (2011), which sought to discuss the shortage of Biology, Physics, Mathematics and Chemistry teachers in Brazil, pointed to the lack of professionals in the area. These authors signaled a longevity needed for Brazil to end the shortage of teachers in these subjects. The study to answer this question, assumed that the total of vacancies offered annually in face-to-face mode in 2007 remained constant. We encourage you to consult this article in its entirety, as this study suggested there are many job openings for these areas.

Even with the projections made, the scenario can be unstable due to political changes in the country, such as the change in high school, which is currently occurring, and is reflected in teacher education. The expansion of the workload of the new high school and the compulsion of some subjects in the three years, such as Mathematics, for example, will require more teachers in this area, which will affect the projection made in the study by Araújo and Vianna (2011).

It is noteworthy that in some cities in the interior and even in the capital of the state of Mato Grosso still lack mathematics teachers, which leads us to believe that the situation of R38 is something, as already said, still punctual. This fact can be seen in the speech of the president of the Public Education Workers Union of the State of Mato Grosso, Henrique Lopes, when he said about the "blackout" of teachers in some teaching areas in Mato Grosso schools, including Mathematics: "Always at the beginning of the school year we have this problem". For some time now there has been this 'blackout' of professionals in more critical disciplines such as portuguese, math, chemistry,

physics and biology."³ (news published by the Folhamax de Mato Grosso, on 03/22/2017).

It is worth noting that the results are influenced by many factors, such as the increase in university places for these areas. It is noteworthy that studies on the subject are valid and contribute to the public policies of teacher education..

Final considerations

The results showed a high number of graduates in Natural Sciences and Mathematics Degree outside teaching practice. The reasons were varied, but there were highlights for the social and financial devaluation of the profession and the structural precariousness of the schools..

The school census and other studies pointed to the lack of teachers in chemistry, physics and mathematics across the country, contributing to the "blackout" in these areas of training, strategically important for the formation of qualified, critical and reflective citizens.

For greater reflection of the importance of teaching performance, aiming at the permanence of these professionals in teaching, there are many external elements, in the vast majority, the result of frustrated public policies, contributing to the worsening of the scenario.

Before this scenario undermines other areas, which depend directly or indirectly on sound basic education in the fields of natural sciences and mathematics for the advancement of higher education, we hope that public policies will be rethought and focused on correcting the current situation, as at the moment seem far from success.

References

ARAÚJO, Renato santos; VIANNA, Deise Miranda. A carência de professores de Ciências e Matemática na Educação Básica e a ampliação das vagas no ensino superior. *Ciência & Educação*, v. 17, n. 4, p. 807-822, 2011.

DINIZ-PEREIRA, Júlio Emílio. O ovo ou a galinha: a crise da profissão docente e a aparente falta de perspectiva para a educação brasileira. *Revista Brasileira de Estudos Pedagógicos*, Brasília, v. 92, n 230, p. 34-51, jan./abr. 2011.

GATTI, Bernardete *et al.* *Atratividade da carreira docente no Brasil*. Fundação Victor Civita. Estudos e Pesquisas Educacionais. São Paulo: Fundação Carlos Chagas, 2009.

MASSON, Gisele. Requisitos Essenciais para a Atratividade e a Permanência na Carreira Docente. *Educ. Soc.*, Campinas, v. 38, n. 140, p. 849-864, jul.-set., 2017.

³ <http://www.folhamax.com.br/cidades/escolas-de-mt-sofrem-com-falta-de-professores/118560> accessed on 29/08/2017.

PINTO, José Marcelino de Rezende. O que explica a falta de professores nas escolas brasileiras? *Jornal de Políticas Educacionais*, n. 15, Jan./jun. 2014.

TREVISAN, Eberson Paulo; MELLO, Irene Cristina de. A formação de professores no ensino de Ciências e Matemática: Perspectivas e desafios. *REP's – Revista Eventos Pedagógicos. Sinop*, v. 8, n. 1 (21. ed.), p. 574-581, Jan/jun. 2017.