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Article

# The entry of graduates of higher education degrees into teaching

A entrada dos egressos de licenciaturas da educação superior na docência

La entrada de graduados de educación superior en la enseñanza

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**Abstract:** This article analyses the relationship between qualitative differences in the education and training of graduates from higher education teaching programmes and the outcomes they achieve in formal employment in Brazil. We used data from Enade 2011 and RAIS 2014 to investigate two types of outcomes for graduates in the labour market: (1) entry into formal employment; and (2) employment in typical teaching occupations. The analysis indicates inequalities in outcomes by gender, race, and above all, socio-economic level of graduates, as well as showing that qualitative differences in higher education are important for their occupational destiny.

**Keywords**: higher education; teacher training; teacher labor markets; basic education; social stratification.

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**Resumo:** Este artigo analisa a relação entre as diferenças qualitativas na formação dos graduados dos cursos de licenciatura da educação superior e os resultados que os egressos obtêm no emprego formal no Brasil. Utilizamos os dados do Enade 2011 e RAIS 2014 para investigar dois tipos de resultados dos graduados no mundo do trabalho: (1) entrada no emprego formal; e (2) emprego na ocupação típica de docência. A análise indica desigualdades nos resultados por gênero, raça e, sobretudo, nível socioeconômico dos egressos, além de mostrar que as diferenças qualitativas na educação superior importam para o seu destino ocupacional.

**Palavras-chave:** educação superior; formação docente; mercado de trabalho para docentes; educação básica; estratificação social.

**Resumen:** Este artículo analiza la relación entre las diferencias cualitativas en la formación de graduados de los cursos de grado de educación superior y los resultados que los graduados obtienen en el empleo formal en Brasil. Utilizamos los datos de Enade 2011 y RAIS 2014 para investigar dos tipos de graduados en el mundo del trabajo: (1) entrada al empleo formal; y (2) empleo en la ocupación típica de la enseñanza. El análisis indica desigualdades en los resultados por género, raza y, sobre todo, el nivel socioeconómico de los graduados, así como para mostrar que las diferencias cualitativas en la educación superior son importantes para su destino ocupacional.

**Palavras clave**: educación superior; formación de professores; ocupación docente.

## 1 Introduction

Teacher education in higher education plays a central role in educational policies aimed at improving the quality and equity of teaching practice in the classroom. Although academic qualifications alone are insufficient to evaluate teacher effectiveness, completion of an undergraduate degree program in the area they teach is associated with recognised factors for improving student educational outcomes, especially for the most disadvantaged students, such as mastery of content and effective adoption of teaching methods and resources (PAUL; BARBOSA, 2008; CARVALHO *et al.*, 2021). Therefore, it is not surprising that expanding specific higher education teacher education for basic education teachers is enshrined in goal 15 of the National Education Plan (BRASIL, 2014), and recent regulatory initiatives for teacher education, such as the National Curriculum Guidelines for Initial Teacher Education for Basic Education and the Common National Base for Initial Teacher Education for Basic Education (BNC-Formação) (MEC, 2019), aim to improve the quality of teacher education.

However, there is a gap between the completion of higher education teacher training courses and the actual exercise of teaching that affects not only the composition of the basic education teacher workforce, but also the outcomes that this group achieves in their professional insertion and trajectory. Firstly, like in other Latin American countries, the teaching profession suffers from structural deficiencies in Brazil, such as unsatisfactory remuneration and poor working conditions, which repel graduates who received quality initial training (VAILLANT, 2006; LOUZANO *et al.*, 2010). Secondly, being a predominantly female profession, professional insertion decisions are strongly influenced by family choices, such as aspects involving marriage and fertility (ALVES *et al.*, 2016). Lastly, the same reasons that reduce the attractiveness of the profession also lead many teachers to seek additional jobs or work in more than one school, which harms students' academic outcomes (ELACQUA; MAROTTA, 2019).

The study of the professional insertion of graduates of teacher training courses can also shed light on aspects of the expansion of the higher education system in the country and its relation to inequalities in the job market for graduates. The intense transformations that have occurred both in the normative scope and in the evolution of the number of enrollments in higher education since the 1990s cannot be understood without observing the behaviour of the Education field, which has been deeply affected by legislative and normative changes concerning teacher training and career (HONORATO; VIEIRA; ZUCCARELLI, 2019; VAILLANT; MANSO, 2022). The issues above become even more interesting when we consider that this same area of training has been relegated to the less prestigious spaces of the system (BROCK; SCHWARTZMAN, 2004).

The present study draws on this literature to discuss to what extent teacher education in higher education is associated with different points of entry into the formal labour market and how the socioeconomic backgrounds of graduates condition this transition. Thus, we seek to take an additional step in relation to previous studies focused on the universe of graduates in higher education in Brazil (VIEIRA; HONORATO; RODRIGUES, 2022; VIEIRA, 2023), by examining how specific qualitative differences in higher education career matter for the professional outcomes of graduates.

We assume that in order to better understand the effect of teachers' characteristics on the performance and progression of basic education students, it is essential to analyze the initial training of these teachers, which is increasingly taking place in higher education. To this end, we used data from the 2011 National Student Performance Exam (Enade), which for the first time in the evaluation's historical series allowed us to identify graduates from 14 different teacher training courses, as well as data on formal employment insertion from the 2014 Annual Social Information Report (RAIS).

Our analysis is organized into two stages. First, we examine the entry of graduates from Education courses into formal employment, with the aim of describing patterns of selectivity in the insertion into the occupational position focused on in this study. Next, we calculate the relationship between social origin and academic training characteristics and the chances of being employed in occupations considered typical or atypical for the Education field.

## 2 Previous Studies and Working Hypotheses

Although teacher education courses traditionally occupy subordinate positions in Brazilian higher education, the expansion of this stage in recent decades repositions the classic problem of literature on social stratification and equal opportunities through schooling. The traditional and patrimonial character of our higher education (PRATES; BARBOSA, 2015) indicates difficulties in expanding this equality, which contributes to the distribution of students being more strongly associated with their social origin than their academic merit or occupational vocation. The effects of this limited openness are clearly visible in the perspective of young students, who greatly value their entry into higher education while realizing that it does not necessarily mean the fulfilment of their dream (BARBOSA; DWYER, 2016).

Given the importance of teacher education programs for Brazilian higher education, both their institutional characterization, including which types of institutions, modalities, and shifts offer the courses, and the socioeconomic composition of enrollments, are fundamental elements to understanding to what extent the expansion of the system can result in some democratization. Enrollments in teacher education courses had the second highest growth in higher education between

1995 and 2015, which can be characterized by three processes (HONORATO; VIEIRA; ZUCCARELLI, 2018): (1) the multiplication of enrollments in private institutions; (2) the increase in course offerings, especially in the North and Northeast regions; and (3) the exponential growth of distance education (DE) modality. If the current trend continues, the next generations of Brazilian teachers will be trained in the DE modality, mainly in private higher education institutions (SANTOS; LIMA; CARVALHAES, 2020).

Similarly to what happens in other higher education systems (GERBER CHEUNG, 2008), teacher training courses in Brazil traditionally cater to socially disadvantaged groups of student-workers, women, and those with low prior academic performance. Several analyses have shown that the Education area is among those where students from lower-income and less-educated families are more likely to graduate, suggesting that this audience is "redirected" by the system to courses of lower social value (BARBOSA; VIEIRA; TAGLIARI, 2017; KNOP; COLLARES, 2019; CARVALHAES; RIBEIRO, 2019). Nevertheless, there are important qualitative differences among graduates of various teacher training courses, with Pedagogy graduates having a more disadvantaged family background than those of other teacher training courses, especially Mathematics and Natural Sciences (ZUCCARELLI; HONORATO; VIEIRA, 2018).

In addition to the literature on the inequality of opportunities in access to and completion of undergraduate teacher education programs, our analysis is also based on two complementary research traditions: the first on mechanisms that explain the economic returns of higher education; and the second on teacher supply and the teaching job market. Both lines of study can be articulated by considering that the social self-selection for teacher education programs that we discussed in the previous paragraphs is directly related to the low monetary and social returns of graduates in the labour market. These studies, together with the characteristics of the teaching job market in Brazil, inform our hypotheses.

Studies aimed at understanding the mechanisms associated with graduates' outcomes in the labour market have indicated the importance of academic formation characteristics, such as the field of study and the skills acquired, and the graduates' professional trajectory, such as work experience during their studies, as explanatory factors for returns to undergraduate degrees (VIEIRA; HONORATO; RODRIGUES, 2022). In line with the human capital theory, prior literature indicates that graduates' skills, especially those that are highly specific and related to well-defined technical profiles, explain a substantial portion of salaries in the labour market (e.g., BOL; HEISIG, 2021; VAN DE WERFHORST, 2002). Some studies show that particularly economic and technical skills related to practical work activities are associated with higher rewards compared to cultural skills (VAN DE WERFHORST; KRAAYKAMP, 2001). Signalling theories, on the other hand, suggest that work experience can be rewarded in the market by indicating to employers, in addition to greater productivity, and lower training costs (AINA; CASALONE, 2020). Regarding the effect of social background on

salaries, previous studies show that family resources partially compensate for signalling failures in less occupationally specific areas of study, particularly at graduates' entry into the labour market (JACOB; KLEIN, 2019).

The literature on the teaching job market has identified a series of factors, financial or not, associated with the individual choices of potential teachers, including salaries and benefits, working conditions, and school location (BETÉILLE; LOEB, 2009). These factors affect the decisions of graduates from teacher education programs to choose teaching as a profession and, if they do, where they will seek to teach. Although studies on teachers in Brazil and Latin America point to characteristics that can increase the attractiveness of the teaching career, such as flexible work hours, vacation time, low unemployment rates, and a sense of altruism associated with the profession (OECD, 2006; VEGAS, 2005), there are few financial incentives for the best high school students to choose teaching as a profession in Brazil (LOUZANO *et al.*, 2010). Reinforcing this scenario, research shows that working in typical occupations for newly graduated professionals in teacher education programs was not associated with higher incomes or higher quality courses (MACIENTE *et al.,* 2015)[1].

National and international studies on teacher supply and career have indicated a relationship between teachers' academic background and a range of professional outcomes, including two that are of interest: (1) the choice between teaching and other careers and (2) the type of school for teaching. Students who choose or express a desire to teach tend to be less academically proficient (GOLDHABER; LIU, 2003; PODGURSKY; MONROE; WATSON, 2004; ALVES *et al.*, 2016) and, among those who choose teaching, those who enter the public school system through competitive exams are more likely to benefit from their families' cultural resources (CASTELLAR *et al.,* 2010). Graduates of more general courses, such as Pedagogy, seem to have a greater chance of working as teachers in public schools than their peers from more specific disciplines (BALLOU, 1996), which may be reinforced by the greater supply of opportunities for these graduates in the public school system in Brazil. Additionally, there is evidence that uniform salary structures for the teaching profession lead to a shortage of teachers in specific areas, such as mathematics and science, as these individuals can access more lucrative job opportunities outside of teaching, including self-employment (MURNANE *et al.*, 1991; VIEIRA, 2023). Finally, several studies point to the regularity that more experienced and better-educated teacher candidates tend to choose schools with better working conditions and a socially advantaged student profile (GOLDHABER *et al.*, 2014; BETÉILLE; LOEB, 2009; PAUL; BARBOSA, 2008).

[1] The authors considered typical occupations for each field which, according to the Brazilian Classification of Occupations (CBO) documentation, are typically (or exclusively) performed by professionals with degrees in those fields.

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Based on the research traditions mentioned and the characterization of the teaching job market in Brazil, we outline some hypotheses about the outcomes of graduates in the teaching profession in the job market.

(1) *Entry into formal employment*

We can expect that graduates from more socially advantaged backgrounds, due to their command of more lucrative work alternatives within their reach, may choose to postpone entering formal employment or enter the job market in other more profitable positions, such as self-employed or employer (hypothesis 1a).

As predicted by signalling and human capital approaches, graduates who possess higher levels of specific skills or who have previous work experience are those who have a better chance of securing formal employment (hypothesis 1b). The authors considered as typical occupations for the field of study those which, according to the documentation of the Brazilian Classification of Occupations (CBO), are usually (or exclusively) carried out by professionals with degrees in the respective areas.

Less specific areas in terms of occupational possibilities (such as Humanities and Pedagogy)[2] are more permeable to the social origin of graduates, which leads to greater inequality in access to formal employment (hypothesis 1c).

Mastery of specific skills required for careers in more profitable areas such as Mathematics and Natural Sciences, with well-defined technical profiles, can expand the range of job opportunities beyond formal employment, reducing the likelihood that these graduates will seek immediate entry into the job market after graduation (hypothesis 1d).

(2) *Employment in typical occupations for teaching degrees*

Since the average salary of graduates with teaching degrees in non-typical higher-level careers is higher than that of teachers (MACIENTE *et al.*, 2015), and mainly achieved by socially privileged graduates, we can expect the following relationships:

Graduates in Natural Sciences and those from private schools, who are more likely to be employed during their studies, are more likely to be employed in non-typical higher-level occupations than their peers from other areas and public institutions (hypothesis 2a).

[2] The degree of occupational specificity is typically measured by the proportion of graduates working in occupations corresponding to their field of study. Courses in Humanities, Arts, and a large portion of Applied Social Sciences usually rank among the least specific areas in both national and international studies (ROKSA; LEVEY, 2010; JACOB; KLEIN, 2019; VAZ; VAZ, 2019).

Graduates with a high level of specific knowledge in their field of study are less likely to be employed as teachers, which are typically less lucrative than other occupations, compared to their peers with lower performance levels (hypothesis 2b).

Graduates from privileged families have a greater likelihood of being employed in non-graduate level occupations compared to graduates from disadvantaged families (hypothesis 2c).

## 3 Methodology

Our data comes from the National Student Performance Exam (Enade) 2011 and the Annual Social Information Report (RAIS) 2014. Enade is an assessment of the performance of undergraduate students, who are divided into three large groups that take turns being evaluated each year. Thus, every three years, the same group of courses is reevaluated. In the exam, graduating students solve general training questions common to all areas and questions specific to their course. In 2011, bachelor's and teaching degree programs were evaluated separately for the first time by Enade. RAIS is an annual administrative record and mandatory declaration for all establishments in the country, containing information on the universe of formal employees in the country.

For this analysis, we obtained access to the restricted versions of the respective databases, which allow individuals to be identified by a unique key. We kept in the data the graduates who met two conditions: (1) were formally employed for two years or less; (2) did not complete postgraduate courses between the year of graduation and the year in which employment is measured. Both filters were performed in order to make the sample more homogeneous, eliminating possible confounding factors on the relationship between higher education and formal employment.

On the other hand, the data used has known limitations (OECD, 2018). Among the problems with Enade, those related to the scope and consistency of information about enrollees deserve mention, which prevents a precise measure of the coverage of the evaluation in relation to the universe of higher education graduates. In addition, the evaluation suffers from problems in the development, selection, and use of test items that imply difficulties in the substantive interpretation of student results on Enade (SCHWARTZMAN, 2005; OECD, 2018).

Table 1 - Number of enrolled in the selected knowledge areas in the 2011 edition of Enade, their representativeness in the Census and their employment in RAIS

| | General | Natural Sciences | Sciences and Humanities | Language | Mathematics | Pedagogy |
|---|---|---|---|---|---|---|
| Number of enrolled students with identifier in Enade | 243804 | 25085 | 31681 | 64423 | 13920 | 108695 |
| Graduates with formal employment three years after graduation (%) | 80,3% | 72,6% | 73,6% | 75,2% | 84,1% | 81% |
| Graduates employed in typical teaching occupations in basic education (%) | 36,7% | 37,6% | 38,2% | 33,9% | 47,2% | 36,0% |

Fonte: ENADE, 2011; INEP, 2023; RAIS, 2014; MTEM, 2023.

As a formal labour market record, the RAIS does not cover workers who are in the informal sector, self-employed or employers, which prevents its results from being interpreted as valid for the universe of Brazilian workers. Being an administrative record with information provided by employers, it should be interpreted with caution due to errors and omissions common to this format of information declaration (DE NEGRI *et al.*, 2001).

The frequency of missing information, especially in variables from the student socioeconomic questionnaire (such as gender, parents' education and race), is a known challenge for using Enade data (VIEIRA, 2023; RODRIGUES, 2024). In addition to these fields, we also observe missing values in the variable that indicates the graduate's employment status and the score in the specific component of the exam. Table 2 describes the pattern of missing values by field of study. The variables with missing data present percentages of missing values between 10% and 25%. In general, the highest percentages are observed for courses in the areas of Humanities and Social Sciences and Languages. To avoid excluding cases with missing information, which could affect the representativeness of the sample, we followed the strategy adopted in other studies (VIEIRA, 2023; RODRIGUES, 2024), opting to impute the values of missing observations through the Multivariate Imputation by Chained Equations method (RUBIN, 1996; BUUREN; GROOTHUIS-OUDSHOORN, 2011).

Table 2 - Percentage of missing values in each variable, by field of study

| Field of Study | Race/Ethnicity | Parental Education | Score on Specific Component | Employment Status |
|---|---|---|---|---|
| Pedagogy | 17,30 | 17,48 | 17,91 | 17,56 |
| Natural Sciences | 14,86 | 15,01 | 18,89 | 14,84 |
| Humanities and Social Sciences | 18,96 | 19,15 | 23,40 | 19,15 |
| Languages | 17,29 | 17,48 | 18,67 | 17,46 |
| Mathematics | 14,86 | 15,17 | 15,75 | 15,13 |

Fonte: Own elaboration.

### 3.1 Dependent variables

Based on the RAIS data, we operationalized two types of dependent variables: (1) a dummy variable indicating whether graduates had a formal employment relationship three years after graduation or not; and (2) the type of occupation of the main job of the graduate, with four categories: "typical teaching occupation", "other typical occupation", "non-typical occupation of higher education" and "other non-typical occupation".

For the classification of typical occupations, we used the eight-digit codes of the Brazilian Classification of Occupations (CBO) from RAIS. Following the strategy of Vaz and Vaz (2019), in addition to the technical requirements of training and experience described in the CBO manual for the exercise of occupations, we also based ourselves on the relative frequency with which each occupation appeared by area of study. As in previous studies (FERNANDES; NARITA, 2001; MENEZES-FILHO, 2012), we considered basic education teachers as typical teaching occupations for all fields of study. Other typical occupations of the teacher training programs, including directors and managers of educational services institutions, higher education teachers, special education teachers, and programmers, evaluators and teaching advisors, were classified as "other typical occupations". The remaining occupations in the large group 2 of the CBO, composed of "Professionals in science and the arts", constituted the category of "non-typical occupation of higher education". Occupations not classified in the previous categories formed the group "other non-typical occupation".

### 3.2 Independent variables

The independent variables in this study are related to the competencies established in the Brazilian National Common Curriculum (BNCC) and the National Common Base for Initial Teacher Education (BNC-Formação). The BNCC organizes the stages of Elementary and High School education into five and four knowledge areas, respectively, and establishes specific competencies that should be developed throughout the student's education. In addition to guiding the formulation of curricula for educational systems and networks throughout the country, the BNCC also served as the basis for the CNE/CP Opinion No. 22/2019, which updated the National Curricular Guidelines for Initial Teacher Education for Basic Education and established the National Common Base for Initial Teacher Education in Basic Education (BNC-Formação). Like the BNCC, the BNC-Formação also establishes general and specific competencies, but this time for teachers.

Considering the organization of the knowledge areas in the BNCC, we reclassified undergraduate courses in the Education field into five categories: Languages, Mathematics, Natural Sciences, Humanities and Social Sciences, and Pedagogy. As Pedagogy courses have traditionally aimed to train not only education researchers and specialists but also teachers for early childhood education and primary school grades, we chose to keep them separate from other teacher education courses. Therefore, the courses were classified as follows:

*i.* Languages: Languages, Visual Arts, Music, and Physical Education.

*ii.* Mathematics: Mathematics.

*iii.* Natural Sciences: Biology, Chemistry, and Physics.

*iv.* Humanities and Social Sciences: Geography, History, Social Sciences, and Philosophy.

*v.* Pedagogy: Pedagogy.

At this point, as a strategy for utilizing the classification used by INEP, no deeper disciplinary distinctions were made, as is customary in studies of professions (ABBOTT, 2003). However, as this is a study on teaching careers, the emphasis on Pedagogy in opposition to the other aggregated areas provides a reasonable approximation of the impact of the type of knowledge mastered by the professional group. That is: the specifically pedagogical knowledge was separated from the various types of specific knowledge in other areas.

The independent variables are listed below. The dummy variable bases are the first category listed in each variable. The sample descriptive statistics are presented in Table 3.

– Gender: female, male.

– Race: black/indigenous, including black, mixed race, and indigenous, and white/yellow, aggregating white and yellow.

– Parents' education: less than high school, high school, and higher education.

– Quartile of performance in the specific component of Enade.

– Work at the end of graduation: does not work, works part-time, and works full-time.

– Age range at the completion of higher education: 18 to 24 years, 25 to 34 years, 35 to 54 years, and 55 years or older.

– Administrative dependence on the higher education institution of the course: public, private.

– Course region: the five political macroregions of IBGE, based on the Northeast.

– Areas of study: Pedagogy, Languages, Mathematics, Natural Sciences, and Human and Social Sciences.

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Table 3 - Descriptive statistics of the sample

| | Pedagogy | Natural Sciences | Social and Human Sciences | Languages | Matematics |
|---|---|---|---|---|---|
| Gender | | | | | |
| Female | 92,0 | 59,9 | 46,7 | 62,9 | 47,0 |
| Male | 7,5 | 39,7 | 52,8 | 36,6 | 52,6 |
| Race/Ethnicity | | | | | |
| White/Asian | 47,3 | 50,0 | 43,6 | 47,2 | 47,3 |
| Black/Indigenous | 35,4 | 35,2 | 37,4 | 35,5 | 37,9 |
| Age | | | | | |
| 18-24 years | 23,0 | 47,1 | 36,9 | 41,0 | 36,8 |
| 25-34 years | 48,0 | 44,6 | 47,5 | 44,4 | 46,6 |
| 35-54 years | 27,5 | 8,0 | 14,4 | 13,8 | 15,8 |
| 55 years or old | 1,6 | 0,3 | 1,2 | 0,8 | 0,9 |
| Parental Education | | | | | |
| Less than High School | 51,6 | 31,6 | 36,3 | 34,6 | 44,6 |
| High School | 20,3 | 29,6 | 25,8 | 26,6 | 25,8 |
| College or Higher | 10,7 | 23,8 | 18,8 | 21,3 | 14,4 |
| Scores on the Enade specific componente (C. E.) | | | | | |
| 1st quartile | 10,6 | 22,3 | 34,0 | 18,4 | 49,0 |
| 2nd quartile | 18,5 | 23,9 | 22,3 | 19,0 | 25,3 |
| 3rd quartile | 24,6 | 21,5 | 14,0 | 20,4 | 7,6 |
| 4th quartile | 28,5 | 13,5 | 6,3 | 23,6 | 2,4 |
| Employment Status | | | | | |
| Not employed | 23,8 | 35,7 | 30,2 | 26,1 | 20,8 |
| Part-time employment | 33,7 | 30,4 | 30,6 | 36,8 | 35,4 |
| Full-time employment | 25,0 | 19,1 | 20,1 | 19,7 | 28,7 |
| HIS Sector | | | | | |
| Private | 76,7 | 44,9 | 37,4 | 59,0 | 37,1 |
| Public | 23,3 | 55,1 | 62,6 | 41,1 | 62,9 |
| Region | | | | | |
| Central-West | 7,2 | 12,2 | 9,8 | 10,6 | 9,9 |
| Northeast | 11,1 | 22,4 | 21,0 | 17,6 | 23,4 |
| North | 7,4 | 9,1 | 8,5 | 10,4 | 17,9 |
| Southeast | 42,7 | 42,0 | 42,7 | 43,6 | 33,1 |
| South | 31,6 | 14,3 | 18,1 | 17,8 | 15,7 |

Source: Own elaboration based on data from Enade 2011 and RAIS 2014.

### 3.3 Models

Our analysis is divided into two sections. First, we examine the pattern of entry into formal employment among graduates of Education courses, highlighting the differences between fields of study in the probability of accessing formal employment versus being unemployed. In the second, we estimate the relationship between the characteristics of education and the academic trajectory of graduates in each field of study and their chances of being employed in typical teaching occupations, compared to other occupational groups (other typical, non-typical higher education, and non-typical occupations that do not require a higher education degree). Since our goal is to capture the influence of teacher education on the occupational allocation of graduates in the formal labour market, we use appropriate models for handling binary and categorical variables. We chose to use logistic models to analyze the chances of being employed and multinomial models to examine employment in different occupational groups.

The analysis models were adjusted to test each hypothesis presented in the previous section. We present the results of the logistic or multinomial models in terms of odds ratios to facilitate interpretation.

## 4 Results

### 4.1 Entry of graduates from teaching courses into formal employment

Table 4 shows the results of the general model that estimates the chances of graduates having formal employment. As our hypothesis 1 predicts, male, black graduates from teaching courses who come from less educated families have a greater chance of being formally employed compared to their peers who are female, white, and graduates with more educated parents. The lower chances found for women may be associated with the fact that they are more likely to continue studying than men (CONNOR; POLLARD, 1996; IESALC, 2021) and to withdraw from the workforce due to maternity or other family care activities (TEICHLER, 2000).

The result for the group of white graduates, and especially those from more educated families, who have 25% less chance of being employed than their peers without a high school education, may be partly explained by the fact that the socially advantaged graduates are typically the ones with more resources to postpone entry into the labour market, either to continue their studies or to await better job opportunities, as a way to secure advantages in the world of work or avoid downward mobility. Although we do not have data to assert the educational or occupational outcomes of this group, our explanatory hypothesis has found support in other

contexts characterized by low economic activity in the labour market for graduates (REIMER; NOELKE; KUCEL, 2008).

Table 4 - Logistic models with the chances of formal employment of graduates from teacher education programs

| | Exp(B) | B | Error | Sig. |
|---|---|---|---|---|
| Intercept | 2,250 | 0,811 | 0,020 | 0,000 |
| Male | 1,143 | 0,134 | 0,011 | 0,000 |
| White | 0,974 | -0,027 | 0,011 | 0,021 |
| High school | 0,955 | -0,046 | 0,014 | 0,001 |
| College or higher | 0,754 | -0,283 | 0,013 | 0,000 |
| 25-34 years old | 0,843 | -0,171 | 0,012 | 0,000 |
| 35-54 years old | 0,542 | -0,613 | 0,015 | 0,000 |
| 55 or older | 0,119 | -2,132 | 0,040 | 0,000 |
| CE: 2nd Quartile | 1,024 | 0,023 | 0,016 | 0,134 |
| CE: 3rd Quartile | 1,094 | 0,090 | 0,016 | 0,000 |
| CE: 4th Quartile | 1,263 | 0,233 | 0,016 | 0,000 |
| Full-time work | 2,112 | 0,747 | 0,015 | 0,000 |
| Part-time work | 1,709 | 0,536 | 0,013 | 0,000 |
| Private | 0,966 | -0,035 | 0,012 | 0,004 |
| North Region | 1,221 | 0,200 | 0,019 | 0,000 |
| Southeast Region | 1,924 | 0,654 | 0,015 | 0,000 |
| South Region | 1,652 | 0,502 | 0,017 | 0,000 |
| Central-West Region | 1,809 | 0,593 | 0,021 | 0,000 |

Source: Own elaboration based on data from Enade 2011 and RAIS 2014.

Graduates who had work experience during their studies have higher chances of being employed than their peers who did not work. The consistent increase in employment chances according to the growth of performance in specific competencies suggests that both variables can be suitable proxies for graduates' skills for work. Removing from the sample those graduates who were already employed in the job measured by RAIS at the time of completion of higher education reinforces the possibility anticipated by our hypothesis 1b, that other forms of work during graduation signal greater productivity to employers, increasing the chances of obtaining formal employment.

The patterns found vary according to the fields of study. The Mathematics field is the one in which graduates have, on average, the highest chances of being formally employed, followed by Languages and Pedagogy, which is consistent with studies indicating that these are the areas with the greatest demand for teachers (PINTO, 2014). This data is reinforced by the fact that around half (47.2%) of the Mathematics graduates in our sample were employed as basic education teachers. Additionally, the observed difference between mathematicians and other graduates is consistent with literature indicating that employers are more likely to compete for graduates from "hard areas", regardless of whether it is for teaching positions or not, for which there tends to be a lack of qualified candidates. On the other hand, occupationally less specific fields offer graduates the opportunity to access a wider range of job vacancies, not necessarily related to their field of study (ROKSA; LEVEY, 2010).

Although the observed patterns for the socio-economic characteristics of graduates are generally reproduced in different areas of study, there are some important variations, as shown in Table 4. Pedagogy appears as the only area in which white and yellow graduates have a small advantage in the probability of being employed, compared to black and indigenous graduates. The results point, therefore, to racial inequality in access to formal employment even in the area that is most accessed by socially vulnerable groups. Contrary to our hypothesis 1c, we did not find greater inequality by social origin in less specific areas. The absence of a significant difference in the chances of formal employment between graduates from more and less educated families in the area of Mathematics may be associated with greater selectivity in this area, due to its connection to jobs with higher average remuneration.

As expected in our hypothesis 1d, high performance in specific skills in Enade among graduates in Mathematics and Natural Sciences is associated with lower chances of formal employment. Full-time work experience at the end of graduation consistently increases the chances of formal employment in all areas of study. And graduation from private institutions only increases the chances of employment among graduates in Mathematics and Natural Sciences.

Table 5 - Logistic models with the chances of formal employment of graduates of undergraduate degrees by area of study (one for each area)

| | Languagens | Mathematics | Natural Sciences | Social and Human Sciences | Pedagogy |
|---|---|---|---|---|---|
| Intercepto | 2.53 (0.038) *** | 3.13 (0.077) *** | 1.663 (0.053) *** | 1.917 (0.046) *** | 2.245 (0.04) *** |
| Masculino | 1.013 (0.019) | 1.188 (0.049) *** | 1.37 (0.031) *** | 1.18 (0.026) *** | 1.23 (0.032) *** |
| Branco | 0.905 (0.022) *** | 0.981 (0.055) | 0.931 (0.032) * | 0.925 (0.031) * | 1.044 (0.02) * |
| Ensino Médio | 0.962 (0.026) | 0.927 (0.061) | 0.981 (0.035) | 1.002 (0.044) | 0.952 (0.024) * |
| Superior ou mais | 0.774 (0.028) *** | 0.939 (0.07) | 0.749 (0.037) *** | 0.758 (0.044) *** | 0.807 (0.028) *** |
| 25-34 anos | 0.814 (0.021) *** | 0.996 (0.055) | 1.052 (0.031) | 0.866 (0.03) *** | 0.669 (0.023) *** |
| 35-54 anos | 0.594 (0.029) *** | 0.697 (0.072) *** | 0.831 (0.057) ** | 0.481 (0.042) *** | 0.414 (0.025) *** |
| 55 ou mais anos | 0.129 (0.088) *** | 0.133 (0.17) *** | 0.155 (0.213) *** | 0.091 (0.102) *** | 0.096 (0.056) *** |
| CE: 2º Quartil | 1.114 (0.032) ** | 1.119 (0.069) | 1.029 (0.043) | 0.987 (0.036) | 1.135 (0.032) *** |
| CE: 3º Quartil | 1.176 (0.031) *** | 0.97 (0.086) | 0.972 (0.047) | 1.051 (0.04) | 1.364 (0.031) *** |
| CE: 4º Quartil | 1.3 (0.03) *** | 0.805 (0.105) * | 0.869 (0.054) * | 1.013 (0.043) | 1.731 (0.031) *** |
| Trabalho integral | 1.835 (0.03) *** | 2.283 (0.068) *** | 2.494 (0.044) *** | 2.161 (0.041) *** | 1.962 (0.025) *** |
| Trabalho parcial | 1.46 (0.021) *** | 2.031 (0.061) *** | 2.134 (0.036) *** | 1.812 (0.035) *** | 1.648 (0.024) *** |
| Privada | 1.002 (0.021) | 1.291 (0.063) *** | 1.219 (0.033) *** | 0.963 (0.031) | 0.853 (0.024) *** |
| Região Norte | 1.128 (0.034) *** | 1.02 (0.068) | 0.933 (0.051) | 1.705 (0.049) *** | 1.238 (0.035) *** |
| Região Sudeste | 1.565 (0.027) *** | 1.517 (0.071) *** | 1.549 (0.041) *** | 2.567 (0.035) *** | 2.412 (0.029) *** |
| Região Sul | 1.565 (0.032) *** | 1.902 (0.092) *** | 1.562 (0.051) *** | 2.129 (0.042) *** | 1.828 (0.03) *** |
| Região Centro-Oeste | 1.669 (0.036) *** | 1.768 (0.095) *** | 1.712 (0.052) *** | 1.864 (0.048) *** | 2.148 (0.04) *** |

Nota: "+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001".

## 4.2 Employment of graduates in typical or non-typical occupations

Table 6 presents the complete multinomial model used in this article to estimate the chances of graduates being employed in different types of occupations, with teaching as the reference category. The model shows that a degree in Languages or Natural Sciences is associated with an increase (of almost 4.5 and 2.6 times, respectively) in the chances of being employed in non-typical higher education occupations, compared to Pedagogy. It is also worth noting that Mathematics is the area with the highest chances of having graduates employed as teachers.

In addition to the field of study, we also observed the importance of another qualitative dimension, such as the administrative dependence of the IES, for the chances of access to different types of occupations. In particular, completing a teaching degree in private institutions is associated with an increase in the chances of being

employed in non-typical occupations, especially those that do not require higher education, compared to graduation from public institutions.

Thus, considering the results for field and sector, the evidence only partially supports our hypothesis 2a. It is possible that the availability of more profitable job opportunities outside of teaching for graduates in Natural Sciences, as pointed out in the literature, partially explains this result. Regarding the field of Languages, we speculate that the less specific professional character of this field allows a relevant proportion of graduates to access occupations that are not related to teaching.

These results highlight important aspects of professional group formation. In both cases, the degree of codification (and abstraction) of knowledge mastered by a profession is an important factor in delimiting spaces in the labor market and establishing rules for entry into these specific jobs (Larson, 1977; Abbott, 1988). Even in the field of teacher education, the more abstract and codified knowledge of Mathematics and Natural Sciences seems to confer some advantages to their holders.

The observed result regarding the graduates from private institutions, who would be less involved in teaching careers than their peers from public institutions, may be associated with at least two combined factors: i) the dominant patrimonialism in public institutions causes the curricular design of courses to be more academic-intellectual than technical-professional; and ii) the socio-economic situation of graduates from teaching courses offered in the public system, generally with lower family income and less integrated into the job market than their peers from the private sector, prevents them from mastering the most profitable work alternatives available to them. Additionally, the fact that teacher education courses offered by private institutions are almost entirely focused on Pedagogy, especially in the distance learning mode, adds other contours to the problem, on which research still needs to advance (TAGLIARI, 2020). In this sense, factors related to the institutional model of higher education impact the professional insertion of students.

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Table 6 - Multinomial models with the chances of employment by type of occupation (reference category: "Typical: Teacher")

| | Típica: Outras | Não típica: Superior | Não típica: Outras |
|---|---|---|---|
| Intercepto/ | 0.203 (0.058) *** | 0.041 (0.074) *** | 1.991 (0.031) *** |
| Masculino | 1.195 (0.032) *** | 1.896 (0.032) *** | 1.109 (0.016) *** |
| Branco | 0.953 (0.027) + | 1.046 (0.035) | 0.964 (0.015) * |
| Ensino Médio | 1.225 (0.033) *** | 1.419 (0.044) *** | 1.03 (0.016) + |
| Superior ou mais | 1.372 (0.041) *** | 1.697 (0.053) *** | 1.018 (0.021) |
| 25-34 anos | 1.049 (0.03) | 0.808 (0.033) *** | 1 (0.015) |
| 35-54 anos | 1.164 (0.038) *** | 0.518 (0.055) *** | 0.973 (0.02) |
| 55 ou mais anos | 1.156 (0.16) | 0.687 (0.237) | 1.251 (0.08) ** |
| CE: 2º Quartil | 1.061 (0.042) | 1.042 (0.05) | 0.922 (0.022) *** |
| CE: 3º Quartil | 1.166 (0.039) *** | 1.063 (0.048) | 0.838 (0.023) *** |
| CE: 4º Quartil | 1.181 (0.041) *** | 1.073 (0.048) | 0.78 (0.022) *** |
| Trabalho integral | 1.063 (0.038) | 1.103 (0.041) * | 1.103 (0.018) *** |
| Trabalho parcial | 0.999 (0.034) | 0.859 (0.04) *** | 0.868 (0.017) *** |
| IES Privada | 0.955 (0.031) | 1.286 (0.036) *** | 1.345 (0.016) *** |
| Região Norte | 0.837 (0.049) *** | 0.657 (0.065) *** | 0.705 (0.025) *** |
| Região Sudeste | 1.064 (0.041) | 1.29 (0.047) *** | 1.042 (0.021) + |
| Região Sul | 0.643 (0.045) *** | 0.696 (0.054) *** | 0.548 (0.023) *** |
| Região Centro-Oeste | 0.932 (0.054) | 0.978 (0.062) | 0.901 (0.027) *** |
| Ciências da Natureza | 0.426 (0.057) *** | 2.642 (0.057) *** | 1.125 (0.024) *** |
| Ciências Humanas e Sociais | 0.428 (0.051) *** | 1.886 (0.059) *** | 1.088 (0.022) *** |
| Linguagens | 1.046 (0.031) | 4.493 (0.044) *** | 1.048 (0.017) ** |
| Matemática | 0.387 (0.069) *** | 1.105 (0.085) | 0.694 (0.029) *** |

Note: "+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001".

Graduates with a greater mastery of specific competencies have equivalent probabilities of being employed as teachers and in non-typical higher-level occupations. Additionally, they have a higher probability of being employed in other teaching-related activities or as educational institution leaders, which typically

have higher salaries. This result, which partially supports our hypothesis 2b, is in line with studies showing that students who choose to teach tend to be less academically proficient (GOLDHABER; LIU, 2003; PODGURSKY; MONROE; WATSON, 2004) and points to research problems in various dimensions, starting with the quality of education offered, which may be meeting, through twisted paths, some market demands.

Thus, the higher education system has an ideal model of research university for the formation of elites. In the fringes of this ideal, vocational education is devalued, including teacher education. Especially in public universities, which offer a greater variety of undergraduate teacher education programs and whose graduates are more directed towards teaching, these programs are offered at night and cater to people of very modest social origin. These would be the "natural" candidates to seek vocational education that would allow them a more qualified access to the job market. As they cannot access or cannot attend undergraduate programs in the chosen fields (for example, Physics, Chemistry or Biology), these students seek teacher education programs. Perhaps this is an important key to the analysis of the Brazilian higher education system: teacher education as vocational training in strongly academic elite institutions. This key also demands a theoretical-methodological debate on the available knowledge measurements to evaluate the contribution of institutions to the teacher education process.

Finally, as expected in our hypothesis 2c, graduates from teacher education programs who come from socially advantaged families, as indicated by the variable of highest parental education, are less likely to work as teachers than their peers from less educated families. This result, therefore, indicates that even when considering graduates from socially less selective courses, such as teacher education programs, we still observe social disparities in the professional placement of graduates in careers with higher salary returns.

## 5 Final Considerations

An important agenda for discussion on educational policies in Brazil emphasizes problems with the composition of the teaching workforce in the country, including the need to attract the best students to the teaching profession and to address deficiencies in the qualifications of current public school teachers. As a way of contributing to this debate, a significant set of studies has analyzed, on the one hand, who chooses the teaching profession, and on the other hand, how this professional group is characterized in the world of work. However, little is known about the "middle of the road": who are the graduates of teacher education programs who are actually entering the formal labor market in Brazil - in typical occupations such as teaching, or not.

In this article, we sought to at least partially fill this gap, contributing to an understanding of how the academic trajectory and social origin of graduates from

teacher education programs are associated with their insertion into formal employment, particularly in teaching positions. In general, we can organize the results found into three major blocks.

In the first place, there are notable inequalities in entering formal employment by gender, race, and, above all, socioeconomic status. Graduates from highly educated families achieve the best occupational positions, such as non-typical occupations requiring higher education, which have the highest salaries. Male and white graduates also stand out in a predominantly female and black field, having advantages in the most lucrative occupations. These results call into question, albeit not conclusively, the "meritocratic power" thesis of higher education, as there seem to be significant differences in the destinations that the groups representing the "elite" of these courses and other graduates occupy in formal employment.

Second, the results suggest the importance of academic training and trajectory for the professional insertion of teacher education graduates. More experienced graduates with greater mastery of specific teaching skills have a higher chance of formal employment and of working in typical occupations.

A third set of findings shows that qualitative differences between fields of study matter for graduates to have different entry points into formal employment. Graduates from Mathematics and Language fields have higher chances of being formally employed, with Mathematics being the only field where privileged graduates have equal chances as their disadvantaged peers. This field also has the highest chances of graduates working in typical teaching occupations, which is the opposite situation of the Natural Sciences and Language fields.

Despite many differences regarding selection criteria for entry and career progression, the legal and institutional norms that regulate the teaching profession are closely linked to the attractiveness and retention capacity of teachers in the education system. These norms are associated with both the content required in teacher training and the competencies required, and in some cases, specific certification requirements (VAILLANT; MANSO 2022). The lack of clear parameters for the teaching profession is reflected in both the definition of competencies for the position and the relative position of the professional group. As Vaillant and Manso (2022) pointed out, attracting and retaining qualified personnel in a profession that has lost prestige and status has become a crucial problem on the public agenda.

The focus on the attractiveness of the teaching profession and the differentiation between areas of knowledge within the profession itself indicate the existence of problems in the social foundation of this professional group. There are few doubts about the demands that can be made of doctors. However, even though the tasks assigned to teachers are known, intense debates persist about how to train these professionals and about the contours, limits, and framework of their role in the

education system. Teachers are part of a professional group that has difficulty delimiting and controlling the specific knowledge of their work. What is the proper teaching work? There are significant variations according to the level of the education system and also between areas of study. Teaching math is different from teaching Portuguese or biology. What is the teaching/method in the chemistry class and what is chemistry? The core of each profession is established through jurisdictions (ABBOTT, 1988) or areas of knowledge that a specific group controls by defining technical and social rules of belonging to the said group. Unlike doctors, teachers do not define which knowledge "belongs" to the professional group: the debate about teaching as a mission or teaching as a technique shows the degree of dissent about such an essential item in the institutional construction of a group.

This weakness can be translated into social strength, allowing for greater flexibility in professional practice and greater adaptability in the process of internal differentiation within the profession (FREIDSON, 1986). Different professions tend to distinguish among three types of positions among practitioners: the most common and basic being the technical professional, responsible for the daily execution of the tasks of the occupation. A second prominent position would be occupied by academics, responsible for research, teaching and the development of the specific science/technology associated with the group. Finally, in the third position would be the professional contingent dedicated to the managerial tasks necessary for the practice and empowerment of the group and its organizations. It is not difficult to perceive the contours of this internal division of tasks within a professional group, even in the case of teachers.

It is precisely in the position of the technicians that friction/differences of attractiveness can arise between more structured professions (such as mathematicians, physicists or chemists, for example) and others that are less established, such as teachers. These frictions can translate into a choice for a non-typical teaching occupation, turning teaching into a more accessible channel for a profession that is better placed socially.

Our article has several limitations. Firstly, the available data does not contain individual information (e.g. motivations, aspirations, teaching experience), institutional information (e.g. selectivity), and contextual information (e.g. the relationship between salaries by field of study and other salaries) that are relevant to the proposed analysis. Additionally, some of the variables in the data, such as work experience at the end of graduation, which does not specify occupation, condition, duration, etc. of the work, and performance in the specific component of the Enade, lack clear connections with elements that typically matter in job selection, such as experience in the field of study or practical teaching skills. Thirdly, the choice to analyze results at the entry of graduates into the workforce allows only speculation about variations in the relationships found over time as well as on the professional trajectories of graduates.

Fourthly, although we have selected an extremely relevant set of results for analyzing the professional placement of graduates, there are numerous other equally important outcomes (e.g. occupational status, job satisfaction, etc.) for future research on the subject. Finally, the methodological strategy used does not allow for the attribution of causal relationships to the correlations found.

This set of observations highlights the complexity of the relationships between different social groups and the organization of the technical division of labour (GRUSKY; WEEDEN, 2001). We have identified relevant social differences in the possibilities of access and success in distinct knowledge areas. Along with the need for conceptual deepening, these data also demonstrate the existence of grey areas between these knowledge areas, which are spaces of disputes between professions, whose measurement and analysis are questionable. In this study, the use of grades obtained in the specific knowledge test of Enade limits the analysis, both due to the incongruence between the areas and the undefined and low legitimacy of competencies in each professional group (PISSAIA *et al.*, 2018).

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