

Inclusive Education in the Federal Network of Professional and Technological Education: Systematic review¹

Educação Inclusiva na Rede Federal de Educação Profissional e Tecnológica: Revisão Sistemática

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Abstract

This study aimed to understand and analyze academic production in inclusive professional education in the Federal Education System. A systematic review of the literature from the last 12 years (2011 to 2023) was carried out; 28 articles indexed in the CAPES Journal Portal were selected based on the descriptors inclusion*professional education*. The analysis of these articles indicated themes that have been stressed, gaps and connections made in the field of inclusive education. Most studies addressed teaching training, conception, and performance, followed by the actions and practices of the TECNEP program and NAPNE. There was a lack of empirical research and studies on pedagogical practices in inclusive professional education.

Palavras-chave: inclusion; professional education; federal education.

Resumo

Este estudo teve por objetivo conhecer e analisar a produção acadêmica no campo da educação profissional inclusiva da Rede Federal de ensino. Realizou-se uma revisão sistemática da literatura dos últimos 12 anos (2011 a 2023); 28 artigos indexados no Portal de Periódicos CAPES foram selecionados a partir dos descritores inclusão *educação profissional*. A análise desses artigos indicou temas que vêm sendo privilegiados, lacunas existentes e articulações tecidas no campo da educação inclusiva. Destacou-se como temática mais pesquisada a formação, concepção e atuação docente seguida das ações e práticas do programa TECNEP e dos NAPNEs. Verificou-se escassez

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de pesquisas empíricas e de estudos sobre práticas pedagógicas na educação profissional inclusiva.

Palavras-chave: inclusão; educação profissional; rede federal.

1 INTRODUCTION

Institutionalization of special education in Brazil has its origins by the mid-19th century, more precisely in 1854, with education for the blind by the Imperial Instituto de Meninos Cegos [Imperial Institute for Blind Boys] (the current Instituto Benjamin Constant [Benjamin Constant Institute] – IBC) and, later, with that for the deaf, in 1857, by the Imperial Instituto dos Surdos-Mudos [Imperial Institute for the Deaf-Mute] (the current Instituto Nacional de Educação de Surdos [National Institute for Education of the Deaf] – INES). These initiatives started the discussion on education of Persons with Disabilities (PwD)² in the country, as well as on the possibilities, by the same, of learning offices, since in both institutes, workshops of preparation for handiwork were set up (Manica & Caliman, 2015).

Treatment attributed to PwD is marked by three main phases. The first one, in Antiquity (4.000 BC to 395 AD), was a period of total exclusion. The second one, in the end of the 1860s, is marked by the advancement of industrialization and ascension of the social movement for integration of PwD, who started to be absorbed by the labor market within an integrating approach based on the medical model of disability. It was believed that PwD needed to be treated or rehabilitated in order to adequate themselves to social standards in force, with a unilateral effort to prove themselves competent. “That model is responsible for society’s resistance in accepting the need to change its structures and attitudes so as to include in its bosom all people with atypical conditions” (Sasaki, 1997, p. 29)(T.N.: my trans.).

In the third phase, from the late 1980s to the early 1990s, the inclusive thinking is diffused. In this period, it is understood that it is not PwD who need to be prepared for a world of inequalities, but the social milieu that must be adapted to receive them. The focus shifts from the PwD’s limitations to the barriers present in the environment. The basis of this conception is the social model of disability, which differs from the medical model by understanding that the PwD’s problems are rather in the social than in the individual ambit (Sasaki, 1997).

In historical terms, the inclusion of students with Special Educational Needs (SEN) in regular school is a recent fact. Regarding Professional and Technological Education (EPT) in the Brazilian Federal Education System, this process had its

² Within this study, we use the terms Persons with Disabilities (PwD) and Persons with Special Educational Needs (SEN) in consonance with the terminology adopted by the legislations here mentioned. According to the Salamanca Statement (UNESCO, 1994), the term SEN refers to persons whose special educational needs are originated as a result of disabilities or difficulties in learning. Now the term PwD refers to students with “long-term impairments of a physical, mental, intellectual, or sensory nature which, in interaction with one or more barriers, can obstruct their full and effective participation in society on equal conditions with other persons” (BRASIL, 2015, 2nd Art.)(T.N.: my trans.).

landmark with the implementation of the Education, Technology and Professionalization for Persons with Special Educational Needs (TECNEP) programme in 2001. The TECNEP had great impact on the System, especially through its strategy for introduction of the Nucleuses of Attendance to Persons with Specific Needs (NAPNE), whose goal is to promote a culture of familiarity and acceptance of diversity, by seeking to eliminate obstacles to inclusion. The importance of inclusive professional education is made evident in 2022, when it is verified that 18.6 million Brazilians (8.9%) within the age range of two years old or over had some sort of disability. Out of this total, 17.5 million were at an age for working, which is equivalent to 10% of the total population at 14 years of age or over (IBGE, 2022).

As regards the legislation which regulates inclusive professional education, consolidating promotion of labor insertion, the V chapter of the Law of Directives and Bases of National Education (LDB/96) stands out, ratifying special education as school modality offered preferably in the regular educational system. Likewise, the Federal Constitution of 1988 (CF/88) determines, in its 7th XXXI, 37th VIII and 227th II articles respectively, on the prohibition of any discrimination regarding salary and admission criteria for PwD; percentile reserve of public offices and occupations for PwD; necessity of creation of specialized prevention and attendance programs for persons with physical, sensory or mental disabilities; and their social inclusion by means of training for work and familiarity. Another legislation which strengthens labor insertion is the Law nr 8,213/91, which determines on benefit plans of social welfare and institutes quotas for PwD in companies with more than a hundred employees.

Inequalities observed in the process of labor insertion of PwD demand the existence of policies both for guaranty of employment opportunities and for qualification. Thus, the Decree nr 3,298/99 determines on the national policy for integration of PwD and preconizes extension of alternatives for economic insertion by means of professional qualification and incorporation for the labor market. The Brazilian Law of Inclusion (Law nr 13,146/2015) reckons guaranty of access to higher education and professional and technological education in equal opportunities and conditions; and the Law nr 13,409/2016 institutes quotas for PwD in the intermediate and advanced levels of technical courses from the federal institutions of education.

Considering the above, it becomes evident that the national legislation has stood out in the formulation of accords, laws and decrees directed to social and labor insertion of PwD. Nevertheless, the challenge to provide that already existing public policies go beyond what has been legislated and find conditions of becoming effective in practice is still pressing. In comparison with persons without disabilities, PwD have a lower level of instruction and higher rates of unemployment, which generates a negative social and economic impact, hindering their access to social goods, services and benefits.

Sociodemographic indicators in Brazil show alarming inequalities. In the third trimester of 2022, only one out of four PwD concluded the mandatory elementary school. Variation in the illiteracy rate was of 19.5% for PwD, against 4.1% for persons without disabilities. In relation to the level of instruction, 25.6% of PwD concluded high school, against 57.3% of persons without disabilities. Inequalities are extended to salary income. While PwD have actual average revenue of R\$ 1,860, persons without disabilities receive R\$ 2,690 on the average (IBGE, 2022).

According to the last Dashboard of Information and Statistics for Labor Inspection in Brazil, in 2021, of 828,256 vacancies reserved for PwD, only 412,520 (49.81%) were filled, leaving 415,736 vacancies otiose (50.19%). Along the aforementioned year, the process of inspection booked various companies, opening vacancies for inclusion of more 20,196 PwD or rehabilitated ones (BRASIL, 2021). The level of occupation,³ in 2022, was of 26.6% for PwD, less than half of the percentile found for persons without disabilities (60.7%). Of every four PwD at an age to work, one was occupied, that is, of 99.3 million of persons occupied in Brazil, only 4.7% had some disability (IBGE, 2022).

This unequal panorama in educational and labor insertion of persons with and without disabilities deserves attention, since all of them, from the legal point of view, are worthy of access and, even if it may seem utopic to speak of the right of PwD to labor in a country with millions of “typical” persons unemployed, “from the point of view of rights, this percentile would have to be equal for both groups” (Sasaki, 1997, p. 62) (T.N.: my trans.). Professional qualification is an effective possibility for reduction of these distances.

Even though the learning of offices for PwD comes of old, what was being offered was a preparation to execute automatized and repetitive functions in the production line. A limited labor insertion, in which exercise of thinking, decision making, and occupation of chief positions were not possibilities. “The kind of employability of PwD did not make anything possible besides repetition without creativity, proactivity or critical sense” (Manica & Caliman, 2015, p.44) (T.N.: my trans.).

Contrary to this historic-social perspective of a precarious and non-critic professional training, the Federal Network of Professional Education appears with a new conception about the educational system, by means of public and free professional preparation. The Federal System aims at a comprehensive education, which articulates integration between general knowledge and specific knowledge, by developing investigative, reflective and critical capability. Considering labor as *locus* of knowledge production and educative principle, the accomplishment of an education which prepares not only for professional demands, but also for the autonomous exercise of citizenship is sought. This conception recovers the principle of human education in its totality, diffusing general scientific fundamentals of production processes and the bond between education and social practice (Ramos, 2010).

This proposal is coherent with the polytechnic conception, which criticizes the dichotomy between manual and intellectual work (Saviani, 2003) and understands the manual and intellectual aspects of the working process as an indissoluble unit, since there is no purely manual or intellectual work. “Every human work involves concomitancy of the exercise of limbs, hands, and the mental, intellectual exercise” (Saviani, 2003, p. 138) (T.N.: my trans.).

The polytechnic conception concerns the domain of scientific fundamentals over different techniques which characterize the modern productive working process and is related, therefore, to different working modalities, directed either to execute or to conceive and control the process (Saviani, 2003). Created by the Law nr 11,892/2008,

³ **Level of occupation:** it refers to persons who work at least one full hour in a job, either salaried or not, or who have a salaried job from which they are temporarily retired.

the Federal Network is nationally recognized for the teaching quality and social relevance. However, its contribution on a national level within the offer of elementary education is still diminutive. In 2022, of 47.4 million matriculations in the 178.3 thousand Brazilian elementary schools, less than 1% was destined to the Federal Network of education. Its participation in the offer of national high schools is of 3% only, notwithstanding this being the degree of its major expressivity (Brazil, 2022).

Professional education enables the exercise of citizenship, since employment has an importance which goes beyond the monetary matter, being related to the building of social identity and the recognition of individual capabilities. Capitalist society regulates citizenship through professional activity, the citizen being recognized as synonym of worker. Thus, the work card is an identification document validated as an important symbol of citizenship (Batista, 2000).

Accomplishing a quality inclusive professional education is challenging. Nevertheless, PwD who are admitted to professional education have already stood out among their peers, by achieving the necessary prerequisites in terms of formal schooling. When reaching professional education, these students have already shown that they are in a position to learn and, if there is accessibility, will be able to appropriate knowledge in a critical and active manner, developing the necessary abilities to be admitted into the work market. Educational inclusion is more than an insertion of spaces (integration), it is a social commitment which must be allied with conditions of quality teaching-learning (Manica & Caliman, 2015).

Considering the complexity which involves the articulation between professional education, special education, and the working world, this study, of an exploratory character, aims at having knowledge of and analyzing the academic production in the field of inclusive professional education of the Federal Education System, mapping matters which have been favored, existing gaps, as well as the nature of entwined articulations. For such, it was accomplished a systematic review of the literature from the last 12 years, a period corresponding to a wide expansion of the Network, the promulgation of the Brazilian Law of Inclusion (nr 13,146/2015) and the Law nr 13,409/2016, which determines on reserve of vacancies for persons with disabilities in the intermediate and advanced levels of technical courses from the federal institutions of education.

2 METHODOLOGICAL COURSE

Initially, the best literature searching strategy was mapped by using a combination between two descriptors (inclusion, professional education) and five Boolean operators (*, AND, NOT, NOT*gender*, NOT*social inclusion*). The combination inclusion*professional education* proved to be the most effective for returning a higher number of publications related to the subject of interest.

Thus, in September 27, 2023, an advanced search was effected at the CAPES Periodicals Portal by means of the CAFE access, with filters for: any field (author, subject and title); articles; any language; any year; descriptors: inclusion*professional education*.

The search adopted the general directives of the PRISMA 2020 flowchart for systematic reviews and retrieved 349 articles. The filter “peer reviewed” was inserted, which resulted in the exclusion of 146 articles and reduction from their total number to 203. The reading of their titles caused the exclusion of three duplications, resulting in a total of 200 articles for the sorting process.

Three criteria for exclusion were applied to the collection of 200 articles: 1. not having a focus on professional education; 2. studies accomplished in institutions which do not belong to the Federal Education System; and 3. not having a focus on school inclusion, resulting in discard of 167 articles and diminution of their total number to 33. After the reading of abstracts and introductions, there was exclusion of eight researches more, which did not focused on the Federal Education System, with a total of 25 articles remaining, published in the period from 2011 to 2023.

In the selection of the works we applied two criteria for inclusion: 1. having a focus on inclusive professional education in the Federal System in a general way, without specific feature; and 2. in case the study was directed to some modality of instruction, having a feature for professional technical education of intermediate level integrated with high school. Since by the time of the search the calendar year 2023 was in progress, the methodological course was remade in February 7, 2024, with a filter for the year 2023, specifically, which resulted in the selection of three new publications more. Thus, the search protocol resulted in 28 articles for complete analysis.

3 RESULTS AND DISCUSSION

The selected articles were initially categorized as regards their theoretical or empirical nature. Of the 28 articles, 20 are theoretical studies and eight are empirical ones. We point out the small quantity of empirical researches and their inexistence in the period of five years comprehended between 2011 and 2016, a period also marked by little production of theoretical articles (only two). From the year 2019, an increase in general production is observed, with 89.3% of studies concentrated between 2019 and 2023. In the sequential topics 3.1 (empirical researches) and 3.2 (theoretical researches), results will be presented and detailed analysis of these productions will be separately made.

3.1 EMPIRICAL RESEARCHES

The eight selected studies were organized in three categories according to their central topic: 1. Physical and pedagogic accessibility; 2. Teaching training, conception and performance; 3. Challenges of inclusion in the covid-19 pandemic period. These three categories will be approached next.

3.1.1 Physical and pedagogical accessibility

The studies from this category (Chaves *et al.*, 2021; Nunes & Melo Filho, 2021; Hoppe & Cazzarotto, 2022; and Santana & Soares, 2022) represent 50% of the empirical researches. Chaves *et al.* (2021) studied laboratories of the biochemistry field from the Federal Institute of Rio Grande do Sul (IFRS), in the Porto Alegre *Campus*, with feature for accessibility of wheelchair users or persons with reduced mobility. After mapping of the architectural structure, the authors found out that the space had physical barriers which obstructed accessibility or made it difficult. The study alerts to the importance of minding the organization of spaces, considering their finality and accessibility for all persons.

Nunes and Melo Filho (2021) were dedicated to analysis of the level of accessibility of the libraries from the Federal Institute of Pernambuco (IFPE), in the Recife and Garanhuns *Campi*, with a focus on accessibility of the visually impaired (VI). Diagnostic observation indicated that those spaces had to have physical and technological conditions which attended to individual educative needs, since barriers that make difficult or impossible the participation and interaction of persons with visual impairment in those environments were identified, notwithstanding innumerable technological advancements for facilitating pedagogical accessibility. Architectonic concern in construction, installation and adaptation of furniture, space and equipment proved to be indispensable in order to make those spaces accessible.

In the field of pedagogic accessibility, the case study by Hoppe and Cazzarotto (2022) presents the practice of supported apprenticeship as an inclusion tool together with a student from the IFRS with a diagnosis of intellectual disability (ID) and dwarfism. The authors aimed at promoting accessibility and improving learning conditions by offering orientation, instruction, follow-up, feedbacks, and support in the process of labor insertion. This methodology helped the student in the execution of activities and stimulated interactions and share of doubts, proving to be efficacious.

Santana and Soares (2022), in turn, studied pedagogical accessibility in physical education classes by means of the use of adapted sports. Data collection occurred in the Tucuruí *Campus* of the Federal Institute of Pará (IFPA), along with a class from high school composed of 28 sighted students and a blind one. The objective was to verify how the practice of adapted sports (goalball and soccer) favors inclusion of persons with VI in physical education classes. This methodology proved to be important and efficient in the inclusive process, bringing to the sighted students an understanding of the limits and possibilities for persons with VI in what refers to sportive practice.

3.1.2 Teaching training, conception and performance

The studies by Pimenta; Damasceno and Capolillo (2017), Gonçalves and Duarte (2022), and Galasso and Mondoni Silva (2023) represent 37,7% of the empirical researches. They approach questions related to teaching training,

conception and performance based on data from semi-structured interviews and/or an online questionnaire. Pimenta; Damasceno and Capolillo (2017) investigated the process of inclusion and acceptance of students with VI matriculated in a technical course on nutrition and dietetics from the Federal Institute of Minas Gerais (IFMG), with a focus on teaching training and experience.

The accomplishment of a semi-structured interview with seven teachers who performed with VI students pointed out teaching training as one of the barriers which impede or make inclusion difficult. Apprehension by the school community, inexistence of adequate didactic-pedagogic structure, absence of specialized professionals, necessity of support for teachers in their processes of professional education for inclusion and, especially, lack of critical reflection about organization of inclusive schools for acceptance of those students were all observed.

Gonçalves and Duarte (2022) investigated a group of teachers from a technical school linked to the Universidade Federal de Viçosa (Federal University of Viçosa) in order to trace the profile of the teacher of Professional and Technologic Education (EPT) by verifying perceptions, experiences and knowledge in respect of inclusive policies and practices. By means of application of a questionnaire and accomplishment of semi-structured interviews, the authors verified that, even though the teachers were sensitive and conscious of the importance of inclusive policies, a large number of them did not have specific training in the field of special education.

The study presents a board of teachers predominantly composed of bachelors, some of whom without teaching experience previous to admittance in EPT, and a great demand for pedagogic education. Galasso and Mondoni Silva (2023) analyzed perceptions of teachers who performed in technical courses of the intermediate level from the Federal Institute of Espírito Santo (IFES) and verified absence of adequate teaching training to perform with a public of PwD.

For the authors, even though the board of EPT teachers presents a high level of academic education, with Master's degrees and Doctorates, this education does not embrace the area of inclusive education, so that many demonstrate not feeling "prepared" to perform with this public.

3.1.3 Challenges of inclusion in the covid-19 pandemic period

Maraschin; Brancher and Robaina Filho (2022) investigated the challenges faced for inclusion of special education students in two federal technical schools during the covid-19 pandemic period. From the implementation of focal groups and interlocution along with the school managers, it was verified that the pandemic represented a great challenge, resulting in loss of contact with some students and decrease of inclusive actions in one of the institutions. The context demanded institutional effort in order to keep students active by holding meetings, creating WhatsApp groups, providing interpreters for deaf students, recording classes, and identifying students' needs.

3.1.4 Considerations of the empirical studies

The quantity of empirical researches in the studied period is irrisory, being three (37.5%) studies with data collection along with the teachers' body, two (25%) along with the students' body, and only one (12.5%) along with managers. The others (25%) used diagnostic observations to analyze matters of physical accessibility. These data evidence the necessity of giving voice to the school community, in particular to the public of inclusive education within the context of research.

History of the political movement of PwD in Brazil shows that the social context previous to the late 1970s opened little or not any room for PwD to participate in decisions on subjects which concerned them. With the rise of the political movement of PwD, for the first time they were able to become protagonists in their fights and speak for themselves. One of the mottoes of the movement was "Nothing about Us without Us", an internationally diffused expression which synthetizes with fidelity the anxiety for representation (Lanna Júnior, 2010).

Contemporary social organization names and determines those who are supposedly qualified for public debate and decision making on subjects which are delicate for society, excluding minority and subaltern groups, even when these are on the agenda in question. The presupposition is that subaltern persons are not capable of arguing about their own destiny, not even about the political paths through which they shall be upheld by the State (Prado, 2009).

Validating the motto "Nothing about Us without Us" enables one to disrupt processes of silencing and to contemplate the real necessities and perceptions of these citizens. When there is no room for one to sensitively listen to these minorities, once more the silencing, the subalternity, the incapacity, or even the unnecessariness of chance and voice for these persons, before debates about their confrontations, are reaffirmed.

The empirical studies indicated the existence of physical and pedagogic barriers to be remedied and the necessity of more investment in teaching training. Current researches confirm this necessity, indicating that initial education presents a distance from theoretical conceptions that discuss the working world and its intrinsic relation with education, which weakens the teaching training for EPT.

The categories of "physical and pedagogic accessibility" and "teaching training, conception and performance" have direct relation with the pedagogic doings, occupying a centrality in the effectuation of inclusive EPT. An adequate education for inclusive work is fundamental in order that there be pedagogic accessibility, learning, retention and success. Solid and consistent theoretical and practical knowledge helps the teacher to deal with educational demands in a more assertive way, especially in atypical moments which impose challenges of a structural and pedagogic order, as in the case of the covid-19 pandemic and post-pandemic period, in which professionals of education had to make use of many resources and strategies to reduce damages during remote activities.

3.2 THEORETICAL RESEARCHES

The theoretical studies amount to 72% of the selected publications. These were organized in five categories according to their central topic: 1. Teaching training, conception and performance; 2. Inclusive actions and practices related to the TECNEP programmes and the NAPNE; 3. Inclusion policies; 4. Autism Spectrum Disorder (ASD) in EPT; 5. Inclusive professional education.

3.2.1 Teaching training, conception and performance

This was the most researched category, contemplating four theoretical studies (Harami & Faria, 2023; Magalhães; Castaman & Vieira, 2020; Manica, 2011; Silva & Anjos, 2022) and three empirical studies, just previously presented. Gaps succeeding initial education and necessary search for pedagogic complementation and continued education within service emphatically appear in these researches.

The studies point out primordial questions for the inclusive pedagogic process, such as: necessity of a humanized regard of the student, individualized educative planning, respect for different needs, learning styles and rhythms, good relation between teacher and student, and stimulus to an active attitude by the student. Teaching qualification is necessary since, besides pedagogic specificities, the public to be attended is diverse and include a gamut of neurodivergences, frequently disconsidered within the school context, the so-called “hidden disabilities⁴”.

Thinking upon the neurodivergent universe which constitutes the classroom, Silva and Anjos (2022) emphasized the necessity of teaching training for inclusion of Gifted and Talented (G&T) persons in EPT. To the authors, this public remains somewhat invisible within the context of inclusive education, since attention is usually directed to defects, leaving aside promotion of adequate learning conditions for development of various human talents and potentials.

3.2.2 Inclusive actions and practices related to the TECNEP and NAPNE programmes

This category is constituted by six studies (Cunha, 2019; Felipe, 2016; Pereira Gonçalves & Cavalcante, 2023; Magalhães; Marques & Castaman, 2022; Monzón *et al*, 2022; Silva, Pereira & Ribeiro, 2020). These researches convey the importance of the TECNEP programme as starting point of inclusion actions in the Federal System. Even though there had already been isolated practices, this was the first systematized

⁴ Inserted in the Brazilian Law of Inclusion (nr 13,146/2015) by the Law nr 14,624, of 2023, the term **hidden disabilities** refers to neurologic and physiologic conditions of a mental, intellectual or sensory nature, which may not be identified at a first moment, as in the case of ASD, Attention-Deficit/Hyperactivity Disorder (ADHD), among others.

initiative by the public sector, with a view to inclusion of PwD in EPT (Magalhães; Marques and Castaman, 2022).

The analyzed studies point out as main attributions of the NAPNE: development of activities for sensitization, consciousness raising, and capacitation of the academic community; initial identification and acceptance of students with SEN and their families; offer of support and orientation to teachers as concerns didactic-pedagogic adaptations; follow-up for students by offer of inclusive monitorship; besides search for disruption of architectonic, attitudinal and pedagogic barriers.

The nucleuses also have an important role in stimulating production of researches and assistive technologies, and in promoting debates on inclusive education. The authors highlight the demand for teaching qualification, systematization of inclusive actions, structuring and appreciation of the NAPNE, contract of professionals for specialized support, acquisition of material, curriculum flexibility, adequacy of political and pedagogic procedures, among others.

Cunha (2019) analyzed knowledge production on the TECNEP programme in Brazilian post-graduation programs, comprehending the period from 2000 to 2014. Analysis of 20 dissertations and three theses pointed out that policies directed to TECNEP have a major focus on persons and equality of opportunities. Nevertheless, inclusion in Brazil often happens in a disordered way and without planning. The study highlights inexistence of a rigid standardization in activities of the NAPNE, so that each nucleus works according to its reality. The author concludes that, in general, the implementation of the NAPNE had a positive balance in promotion of inclusion, although actions of teaching training must occur in a continuous way, in order to enable changes and necessary adjustments to inclusive practice.

Pereira Gonçalves and Cavalcante (2023) described knowledge status on inclusion of PwD in professional education from the NAPNE/IFRN. Aiming at understanding the role of that nucleus, they surveyed, at the portal of the first academic post-graduation program approved in the Federal Network of Professional and Technologic Education (PPGEP/IFRN), studies which had the TECNEP/NAPNE as object of research. In the period from 2015 to 2023, within a universe of discourse from 104 defended dissertations, only five approached the topic. The main focus was evaluation of the implementing process of the TECNEP programme in the Federal System, highlighting the contributions of implementation of the NAPNE.

Monzón *et al.* (2022) analyzed daily actions by professionals of professional education directed to inclusion of students with SEN, in the *Feliz Campus* of the Federal Institute of Rio Grande do Sul (IFRS), concerning experiences of the NAPNE during the covid-19 pandemic period. The study demonstrated that there was development of remote work with the necessary mediation of digital technologies.

In general, practices involved actions of acceptance, follow-up, promotion of training for teachers and the academic community, offer of inclusive monitorships and supporting professionals, such as Brazilian sign language interpreter for the deaf, creation of inclusive pedagogic strategies, search for assistive technologies, attempt to disrupt barriers, continuous record of developed actions, and sharing of acquired knowledge.

3.2.3 Inclusion policies

In this category, we have the studies by Trevisan and Ziliotto (2023) e Texca *et al.* (2023). Trevisan and Ziliotto (2023) analyzed guiding policies of inclusive EPT in three Federal Institutes – IFRS, Federal Institute Sul-rio-grandense (IFSul) and Federal Institute Farroupilha (IFFar) – from the state of Rio Grande do Sul. This analysis focused on questions related to accessibility, learning, retention, participation and protagonism of students. It was evident that in the three institutions the inclusion policies reckon equality of access, retention and success conditions in the educative course, and guarantee resources and services for promotion of learning, besides adaptations of didactic-pedagogical material and assessment instruments. Nevertheless, they neither regulate nor specify how those premises shall be operationalized.

It was observed that the IFSul policy emphasizes medical categories to the detriment of pedagogical ones, assuming the clinical-medical paradigm of disability. The clinical-medical attitude also guided the IFRS policy by understanding PwD in a conception of incompleteness. None of the policies assured participation or protagonism, neither of PwD nor their families, in the formulation of proposals for the Policy of Diversity and Inclusion, though the IFSul was the only one to reckon participation of PwD (not restricted to students) in meetings, with the condition of their being external observers and collaborators.

The study by Texca *et al.* (2023) aimed at understanding political and pedagogic aspects present in the Pedagogic Projects of Courses (PPC) of Integrated High School from the Federal Institute of Paraná (IFPR), in force in the year 2019. With a feature for the category “inclusion”, the authors analyzed 27 PPC, mapping questions on inclusion, legislations, directives, quotas, student assistance, performance of the NAPNE, among others. They detected that, even if there were guiding principles for theoretical structuring of the projects, 40.28% of those not even mention the category “inclusion”. Only two PPC approached the question of quotas, and little coverage in relation to lawful criteria and necessary directives for regulation of inclusive education also occurred.

The study evidenced that many actions of inclusion performed by the institution are disconsidered in the planning of courses and that directives and lawful documents are not serving as guiding elements for elaboration of projects. Only 18% mention how Specialized Educational Assistance (SEA) will take place and, although the NAPNE take part in the institutional organogram, they are not mentioned as an important instance to help in teaching-learning activities. The authors concluded that consolidation of an inclusive institutional policy is still a challenge, evidenced by the significant quantity of PPC which omit and/or ignore the category “inclusion”.

3.2.4 Autism Spectrum Disorder (ASD) in EPT

This category was contemplated by two studies. Kokkonen, Barbosa and Batista (2022) bring the need to regard neurodiversities and the necessity of SEA offer to students who need it. For the authors, the main difficulties in school inclusion of students with ASD are related to precariousness of the previous educative process, difficulties in concentration and abstraction, insufficiency of material and human resources, unpreparedness of institutions in promoting inclusion, flaws in teaching training, lack of specialists in the inclusive area, and the still marked presence of various manifestations of prejudice which make the learning and acceptance of differences, and the possible adjustment to them, difficult.

Oliveira and Henrique (2023) investigated knowledge production within the context of EPT, observing the relation between the topics of Physical Education (PE), Professional and Technologic Education (EPT) and ASD. The analysis of ten dissertations and three theses highlighted deficient pedagogic practices and teaching training, besides gaps in the intersection of these topics. As a pedagogic practice which works on body language and the culture of motion, PE is an important element in the education of the student with ASD who, because of his/her neurobiological condition, may have difficulties in communication, relations and social interaction, as well as in symbolic games within various contexts. The studies which related PE with EPT pored over pedagogic practices developed in that discipline. As regards the studies on PE and ASD, they present teachers using day-to-day school experiences as a guide to inclusive practices. For the authors, the three topics are relevant and have been structured in a solid way in national research, but have not been specifically found together yet.

3.2.5 Inclusive professional education

This category contemplates six studies (Lopes Cabral; Mota & Gomes, 2022; Cunha; Mota & Miranda, 2020; Galasso & Santos, 2021; Medeiros & Passos, 2019; Oliveira; Nascimento & Tavares, 2022; Tillmann & Almeida, 2020).

Tillmann and Almeida (2020) reflected on the offer of SEA in EPT, defending the necessity of a guaranty of support services in conformity with specific needs of each student. The authors observed that, although SEA has statutory provision, the Law nr 11,892, which institutes the Federal Network, it does not make use of a subject related to inclusion, nor even mentions PwD, so that there is not, within the national ambit, specific legislation or normative law which considers regulation of special education services into the perspective of inclusive education in EPT.

The Federal Network counts on regulations and directives individually structured and followed, so that each institution organizes the offer of SEA from its possibilities and planning. However, the actual state of some Federal Institutes does not fulfill the offer of such service, mainly for lack of specialized professionals.

With a focus on factors of avoidance and retention, Galasso and Santos (2021) accomplished a state of knowledge bibliographic review on the trajectory of inclusive education in Integrated High School, in the period from 2011 to 2020. The authors highlight that, within the context of the Federal System, accessibility, retention, success and combat to avoidance gain evidence in actions of student assistance. They recognize that the possible causes of avoidance are difficult to be identified, since they involve individual, social, economic, cultural and academic factors. The study analyzed the Retention and Success Plans from the Federal Institute of Paraná (IFPR) and the Federal Institute of Ceará (IFCE), situating financial hardships, low performance, family problems and health problems as main factors of avoidance in the IFPR.

As regards the IFCE, the factors of avoidance were attributed to little or not any adaptation of assessments, demotivation occasioned by successively repeating school years, institutional unpreparedness for assistance to the special education public, physical and mental weariness of students, and lack of room for acquaintance of students. Implementation of the NAPNE, assistive technologies, and institutionalization of SEA are confirmed as significant possibilities of contribution for retention of students. Nevertheless, as pointed out in other researches, not every unit of the Federal Institutes has the NAPNE or a SEA professional, so necessary for acceptance and development of these students.

The dyslectic student was the subject of the research by Oliveira, Nascimento and Tavares (2022). The authors analyzed the Political and Pedagogic Project (PPP) from the Federal Institute of Rio Grande do Norte (IFRN), highlighting the necessary teaching improvement in the ambit of inclusion. It was verified necessity of providing multiprofessional and interdisciplinary teams, capable of developing and evaluating persons with limitations and/or atypical learning difficulties, in order to support both the student and the teaching team as far as learning disorders are concerned.

For the authors, it is indispensable to count on a professional diagnosis to identify necessities, and then, to adequate methodologies, strategies and instruments of teaching-learning. They point out the necessity of regarding the educational culture about diversity and reaffirm the relevance of conceptual and technical knowledge on dyslexia in the process of teachers' training for EPT. Difficulty in finding studies with this feature was pointed out as a negative factor, since the field of inclusive education presents a repertory of specific mediations and methodologies to help in the learning of students with dyslexia.

Lopes Cabral, Mota and Gomes (2022) presented a timeline with the panorama of professional education offer to PwD in the Federal Network, highlighting convergences between the course of professional and inclusive education. The authors accomplished a historical recover of the organization of professional education for PwD in Brazil, reinforcing the necessity that what is reckoned in inclusion policies must reverberate over the reality of educational institutions, supplying necessary tools and conditions for inclusion. They believe that, even with advancements in legislation, the proposal of inclusion and effective preparation for social participation has been slowly built in the Federal Network.

Subsequently, a literature review by Medeiros and Passos (2019) and a state of knowledge study by Cunha, Mota and Miranda (2020) are presented, both

developed by means of the mapping of theses and dissertations from the CAPES databank.

Medeiros and Passos (2019) mapped researches on inclusion of students from special education at the Federal Institutes. In the analysis of 23 dissertations and four theses, published in the period from 2013 to 2018, there stood out as most researched topics “conditions of access, retention and accessibility” (45.16%), followed by “conceptions and representations about inclusion” (25.81%). The other researches considered “inclusion policies” (9.68%), “teaching profile, work and training” (6.45%), “diversity policies” (3.23%), “educational management of inclusion” (3.23%), and “school and family trajectories” (3.23%). The authors identified a wide diversity of practices and conceptions of inclusion within the context of EPT, and greater concern with architectonic accessibility than with pedagogic questions. The analyses indicated necessity of advancements in the structuring and practice of the NAPNE, investment in teaching training, actions to support inclusion in the work market, and disruption of attitudinal barriers. The authors conclude that unknowingness or discredit on the potentialities of a person with SEN, as well as behaviors arisen from them (prejudice, discrimination, ableism) are what rather make retention difficult within the context of inclusive EPT.

Cunha, Mota and Miranda (2020) analyzed 79 dissertations and 13 theses published in the period from 2008 to 2018, highlighting as most researched topic “public policies” (33.6%), followed by “inclusion experiences” (25%), “accessibility” (18.6%), “teaching training” (12%), and “NAPNE” (10.8%). Just like in the work of Medeiros and Passos (2019), teaching training was little researched, which for the authors may be related to the fact that discussions on inclusion in this modality of teaching are recent. Recover of researches on inclusion experiences was positive (25%) and showed that inclusive practices have become the focus of well-founded theoretical researches, which strengthens the institutionalization of inclusion.

Medeiros and Passos (2019) point out the need for more researches on curricular adaptation and assessment, whereas Cunha, Mota and Miranda (2020) clamor for special attention to the themes of teaching work and training, since they understand that these are figured as the most pointed out difficulties in inclusive EPT.

3.2.6 Considerations of the theoretical studies

Teaching training is emphatically discussed in various studies, evidencing that gaps in initial education turned pedagogic complementation and search for continued education into primordial services for success of inclusive EPT. Teaching training for EPT has many tension points, especially in what refers to non-requirement of pedagogic education and/or specific qualification for performance in special education. Despite this panorama, Moura (2015) understands that there is a structural problem in the Brazilian educational system, since:

While to perform medicine or any other liberal profession the corresponding professional education is necessary, to perform teaching, mainly professorate or the denominate professional education, there is not much rigor as regards education on the corresponding profession – that of teacher (Moura, 2015, p. 31) (T.N.: my trans.).

Concerns with teaching performance within the context of EPT go beyond problematization on educative necessities of one who already performs in the Network. Education of future professionals who are going through graduations and need adequate preparation also causes concern, since existing licentiates, in general, do not contemplate in a satisfactory way discussions focused on relations between work and education. Teaching training is usually directed to teaching with a propaedeutic character, which rather differs from the humane education proposed by the Federal Network. This demands strategic deepening by means of post-graduation and didactic-pedagogic education programs directed to the specificities of such teaching proposal (Moura, 2015).

Analysis of the EPT teacher's profile must consider questions like inexistence of a State policy which contemplates the teacher's education on all its levels, the distancing of licentiates in relation to teaching training for EPT, career depreciation as manifest in low salaries, precarious working conditions, long working days, overcrowded classrooms, among others. The literature evidences that a large number of EPT teachers do not have pedagogic education, showing a qualification which occurs in the course of professional practice. This practice is conceived by Kuenzer (2003) as "tacit [that is, not systematized] knowledge", which was not taught and is not subject to explanation, since it is originated from a synthesis of knowledge acquired along the professional trajectory.

The gamut of pedagogic specificities and neurodivergences present within the school context makes teaching qualification more and more necessary, since each student may demand a repertory of specific methodologies and interventions. Physical and pedagogic accessibility, and offer of specialized support, are indispensable in order that there be conditions of learning, retention and success for these students. The TECNEP programme and the consequent implementation of the NAPNE appear as fundamental for the opening, acceptance and retention of this public in EPT, although they need higher structuring and investment.

The studies evidence the necessity of extending the protagonism of PwD in the structuring of policies which regard them, and of a greater explicitness about practical operationalization of rights and guaranties lawfully reckoned. It was also verified a process of silencing the topic in the composition of important institutional documents, in which central subjects for the context have been left pending, as in the case of SEA offer. The lack of a general legislation has led Federal Institutes to create specific inclusion policies according to each reality, which results in inequality in the offer of specialized support services.

The literature reviews found did not contemplate production of scientific articles, having as a focus theses and dissertations previous to 2018, which differs from the

temporal feature and the material analyzed in this study. Nevertheless, some constancy is perceived with their interest in the topics “public policies, accessibility, teaching training, NAPNE, inclusion conceptions and experiences”, and little interest in specifically pedagogic subjects linked to teaching and learning.

The studies which accomplished researches in databases with search for dissertations and theses evidenced the existence of a significantly higher quantity of dissertations, in detriment of publication of articles and especially of theses with this feature. This great asymmetry in the format of publications may be associated with the national presence, in a large scale, of the Post-Graduation Program on Professional and Technologic Education (ProfEPT), which even came to offer 1006 vacancies in a single call for applications to a Professional Master’s Degree on Professional and Technologic Education (ProfEPT Notice nr 02/2022). The big question which is raised regards the necessity that the works which are being produced do not remain restricted to the proposing institutions or the group of researchers of the area, but be socialized in various formats, becoming rather accessible to the communities which do need this knowledge.

4 FINAL CONSIDERATIONS

This article proposed to have knowledge of and analyze academic production in the field of inclusive education from the Federal Network of Professional, Scientific and Technologic Education of the country, indicating researched topics, existing gaps, and the nature of articulations between professional education, special education and the working world. Both professional education and inclusive education carry the weight of historical marks of duality and assistentialism, which has divided education between manual workers (the popular classes) and intellectual workers (the elites). The Federal Network proposes a rupture of this paradigm, searching for integration of the intellectual dimension with the productive work, that is, the education of workers capable of performing both as ruling persons and citizens (Ciavatta, 2005).

It is deduced that practices and studies in the field of inclusive professional education have to be more diffused. The most studied subject was teaching training, conception and performance within the context of inclusive EPT, which differs from the findings by Medeiros and Passos (2019) and Cunha, Mota and Miranda (2020), who identified few researches with that feature when they analyzed dissertations and theses previous to 2019. The second more evidenced category comprehended studies on accessibility actions and inclusive practices related to the TECNEP programmes and the NAPNE, discussing about their great importance in the promotion of the inclusive culture and in the accomplishment of actions for following-up specific educational necessities.

The category “physical and pedagogic accessibility” gathered only four articles, but it gets distinction by their empiricism. It is a central category for the understanding of real conditions for effectiveness of inclusive practice in EPT, since it analyses specific realities and successful experiences within this context. Other topics appeared in one or two studies, composing a diversified group which approached inclusion

policies, autism spectrum disorder, avoidance and retention factors, specialized educational assistance, dyslexia, challenges from the covid-19 context, and courses for inclusion of PwD in the Federal System.

The analyzed works present gaps about subjects of extreme relevance within the context of inclusive professional education, especially in respect to operationalization of the teaching-learning process. Studies on didactics, inclusive teaching methodologies, curricular adaptations, assistive technologies, elaboration of individualized teaching plan (PEI), teacher-student relation, and successful teaching practices within the context of EPT are scarce in the literature.

The mapped researches bring general social, political and pedagogic aspects about inclusion processes, with a restricted number of studies which specifically approach some disability (physical, intellectual, auditory, visual) or neurodiversity (ASD, giftedness, dyslexia). It was observed that visual disability has been receiving more attention than the others, which may be related to the historical trajectory of institutionalization of special education in Brazil, started with education for the blind in 1854.

Diversity in learning specificities is a point which demands reflection and care so that we do not incur in the error of disconsidering the infinite particularities of each diagnosis that composes this so-called “umbrella”, which inclusive professional education is. We highlight the necessity of researches which approach didactic-pedagogic questions related to the teaching-learning process and point out successful experiences within the context of inclusive EPT. It urges that room be opened to empiricism and to sensitive listening, not only for persons who are within the context of inclusive EPT, but also for the special education public who egressed from this modality of schooling.

Although professional insertion is the chief finality of EPT, some studies do not bring articulations between special education, professional education and the working world, limiting themselves to mention objectives of EPT and legislative frameworks which sustain the right and guaranty of an education for work. Satisfactorily, it was verified that a large number of the analyzed researches (53%) do bring these articulations to theoretical discussion, understanding that EPT must integrate general and technical education in the pursuit of overcoming the dichotomy between manual and intellectual labor, by means of comprehension, not only of the instrumental nature of work, but also of the conception of the productive process.

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