

Impacts of an Extension Activity on Professional and Technological Education Among Ninth-Grade Students

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ABSTRACT

Extension activities in Elementary Education are essential strategies for democratizing access to information and expanding students' educational repertoire, especially in contexts marked by socio-educational inequalities. This study aimed to identify the level of knowledge and initial interest of 9th-grade students regarding Professional and Technological Education (PTE), as well as to analyze the effects of an informational intervention. The applied, descriptive, and exploratory research involved 26 students and used two structured questionnaires administered before and after the intervention. The results revealed significant prior unfamiliarity with PTE, highlighting existing informational gaps. After the activity, there was an increase in students' understanding and interest in technical education, particularly in federal public institutions, as well as a broader perception of the role of PTE in regional development and the generation of social opportunities. It is concluded that extension activities focused on vocational guidance contribute to the comprehensive development of young people and to more informed educational choices, and their institutionalization in public schools, especially in vulnerable territories, is recommended.

RESUMO

As ações extensionistas no Ensino Fundamental são estratégias essenciais para democratizar o acesso à informação e ampliar o repertório formativo dos estudantes, sobretudo em contextos de desigualdade socioeducacional. Este estudo teve como objetivo identificar o nível de conhecimento e o interesse inicial de estudantes do 9º ano acerca da Educação Profissional e Tecnológica (EPT), bem como analisar os efeitos de uma intervenção informativa. A pesquisa, de natureza aplicada, descritiva e exploratória, envolveu 26 estudantes e utilizou dois questionários estruturados, aplicados antes e após a intervenção. Os resultados indicaram desconhecimento prévio significativo sobre a EPT, evidenciando lacunas informacionais. Após a atividade, observou-se ampliação da compreensão e aumento do interesse pelo ensino técnico, especialmente em instituições públicas federais, além de maior percepção sobre o papel da EPT no desenvolvimento regional e na geração de oportunidades sociais. Conclui-se que ações extensionistas de orientação vocacional contribuem para a formação integral dos jovens e para escolhas educacionais mais conscientes, recomendando-se sua institucionalização em escolas públicas, especialmente em territórios vulnerabilizados.

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Introduction

Professional and Technological Education (PTE) will play a strategic role in strengthening the comprehensive education of Brazilian youth by articulating scientific, technological, and sociocultural knowledge. Recent studies have highlighted the importance of integrating Upper Secondary Education with PTE in order to expand educational opportunities and promote qualified student insertion into further education and the labor market. However, informational gaps still tend to limit adolescents' access, particularly in rural contexts and regions with limited educational provision, thereby intensifying educational inequalities.

It is worth noting that PTE faces structural challenges related to infrastructure, unequal access, and weaknesses in educational guidance processes (Silva et al., 2024). These limitations may directly affect the construction of young people's life projects and their educational choices, especially during the transition from Lower Secondary Education to Upper Secondary Education. Moreover, research on Integrated Upper Secondary Education underscores the need for stronger articulation between schools and PTE institutions to broaden students' understanding of educational pathways and opportunities for continuing their studies (Silva, 2022). In this context, extension actions and informational interventions emerge as effective alternatives to address gaps in vocational guidance and reduce inequalities.

Educational and career guidance during adolescence constitutes a strategic stage for the development of life projects and the construction of more consistent educational trajectories. Nevertheless, many students experience uncertainty regarding educational choices and lack knowledge about available educational alternatives, particularly those related to PTE. This informational gap, which is frequently intensified by socioeconomic and territorial inequalities, may compromise student retention and academic success (Aguar & Conceição, 2009; Queiroz, 2020).

Despite normative advances such as the National Common Core Curriculum (BNCC) and the National Education Plan (PNE), which emphasize youth protagonism, comprehensive development, and the construction of life projects (Brasil, 2014, 2018), significant weaknesses persist in the implementation of structured vocational guidance practices. Several studies indicate that adolescents enter Upper Secondary Education without systematized support for decision-making, which may exacerbate educational vulnerabilities (Campos, 2022; Melo-Silva, Munhoz & Leal, 2019; Noronha & Ottati, 2010).

In Brazil, PTE is configured as an educational pathway that integrates science, culture, work, and technology, fostering comprehensive human development (Pais et al., 2023; Ramos, 2010). However, understanding of this educational modality remains limited among Lower Secondary Education students, especially in regions marked by social vulnerability and inequality. Studies show that the lack of awareness of technical pathways and prospects for

educational continuity is particularly pronounced in inland territories of Brazil's Northeast region (Lebourg, Coutrim & Silva, 2021).

Thus, the democratization of knowledge about PTE should be understood as a policy of educational and social inclusion. The absence of information reinforces historical barriers and restricts the right to envision and construct a future, particularly among low-income youth and those from families with low levels of formal education (INEP, 2024). As Freire (1996) argues, emancipatory educational processes must enable individuals to critically understand their context and act toward transforming reality, an endeavor that necessarily includes informed access to educational opportunities.

Within this framework, university extension emerges as a key instrument for articulating public schools, local territories, and citizenship, strengthening institutional bonds and contributing to the construction of young people's life projects (Silva & Coutinho, 2024). Consequently, extension actions focused on vocational guidance assume significant social and educational relevance, particularly in the Potiguar Semi-arid region, by promoting more informed choices and reducing informational inequalities.

From this perspective, the present study aimed to identify the level of knowledge and initial interest of 9th-grade Lower Secondary Education students regarding Professional and Technological Education (PTE), as well as to evaluate the impact of an informative extension intervention on expanding their understanding and shaping their educational expectations.

Materials and Methods

The study was conducted at José Neri de Oliveira Municipal School, in the municipality of Doutor Severiano, Rio Grande do Norte, Brazil. The institution is situated in an easily accessible urban area, as evidenced by its geographical location. The school serves students enrolled in Lower Secondary Education and has infrastructure consisting of well-ventilated classrooms, a library, administrative offices, an internal courtyard, and spaces designated for pedagogical and recreational activities. The classrooms used in the study featured natural ventilation, adequate lighting, and spatial organization conducive to the development of collective activities, an aspect particularly relevant for participatory educational interventions.

A total of 26 students from a 9th-grade class participated in the study. The group comprised adolescents whose age range was compatible with the educational level and who displayed diversity in learning pace, engagement levels, and school experiences. This class was selected based on its availability within the school schedule and its involvement in curricular content related to the investigated theme. For documentation purposes, photographs were taken of the school façade, the internal spaces used, and the participating class, allowing for better contextualization of the research setting.

Initial diagnosis

The initial diagnosis was carried out through a preliminary visit to the school, during which it was possible to observe the physical environment, follow the institutional routine, and engage in dialogue with members of the pedagogical team and involved teachers. These interactions enabled an understanding of the class profile, school dynamics, and the formative demands identified by educators. Based on this information, the data collection instrument was developed to capture students' prior knowledge of Professional and Technological Education (PTE).

Subsequently, a diagnostic questionnaire was administered to the students with the objective of identifying their initial knowledge, perceptions, and level of interest regarding PTE and Integrated Upper Secondary Education. The application of this instrument allowed verification of the initial hypothesis that students had limited information about these educational modalities, providing support for adjusting the pedagogical approach.

Educational intervention

The educational intervention consisted of a dialogical expository lecture addressing the importance of studying at Federal Institutes, with an approximate duration of 60 minutes. During the activity, printed leaflets were distributed to students in order to reinforce the orally presented content. The lecture began with the presentation of the concept of Integrated Upper Secondary Education, outlining its historical development from the Schools of Apprentices and Artisans established in 1909 to the consolidation of the Federal Institutes in 2008.

Subsequently, aspects of daily life in a technical school were discussed, including the balance between theoretical and practical activities, the development of professional skills, and student participation in projects, scientific events, internships, and extension activities. The benefits of technical education were also presented, such as teaching quality, professional recognition, opportunities for insertion into the world of work, and student support programs aimed at individuals in situations of socioeconomic vulnerability.

The lecture also addressed themes such as sustainability, social impact, and inclusion, highlighting the role of federal institutions in promoting applied research, community development, and the democratization of access to high-quality public education. Finally, students received information about admission pathways to Federal Institutes, including selection processes and public calls. Active student participation was documented through photographs, which evidenced engagement, interaction, and relevant questions related to the presented content.

Post-intervention evaluation

Following the lecture, a second questionnaire was administered to assess the impact of the intervention on students' knowledge and interest regarding Professional and Technological

Education. This instrument contained questions equivalent to those used in the initial diagnosis, enabling a direct comparison between the two stages.

Objective responses were entered into an electronic spreadsheet, allowing data systematization and quantitative analysis, while open-ended responses and justifications provided by students were compiled into a single document for qualitative analysis. The comparison between pre- and post-intervention instruments made it possible to identify advances in students' understanding, changes in perceptions regarding enrollment in technical schools, and greater conceptual clarity about PTE and Integrated Upper Secondary Education.

Data organization and analysis

Data collected through both instruments were analyzed using a mixed-methods (quantitative–qualitative) approach. The first questionnaire included information on students' socio-family context, career perspectives, and, primarily, their prior knowledge of PTE and Integrated Upper Secondary Education. Key questions included: “Do you have any knowledge about PTE?”, “Are you familiar with the integrated upper secondary education model?”, “Do you intend to pursue technical education?”, and “Does your family influence your career choice?”.

The post-intervention questionnaire aimed to assess potential transformations in students' understanding. Its main questions included: “Do you now know what Professional and Technological Education is?”, “Are you able to explain what integrated technical education is?”, “Has your opinion about technical schools changed?”, and “Are you interested in studying at an integrated technical school?”. Questions regarding clarity of the presented content, preference for specific courses, and participant suggestions were also included.

Objective responses were tabulated in an electronic spreadsheet, enabling the production of comparative graphs and tables between the initial diagnosis and the final evaluation. Open-ended responses were analyzed qualitatively, allowing the identification of perceptions, difficulties, conceptual advances, and indications of changes in educational interest. The triangulation of these two data sets provided a comprehensive understanding of the impact of the educational intervention on the participating students.

Results and Discussion

Initial knowledge

The initial diagnosis indicated that students' level of knowledge about Professional and Technological Education (PTE) and the integrated technical education model was significantly low, as 66.7% of the students reported having no prior knowledge of the topic (Table 1). Despite this lack of knowledge, a relevant finding was observed: 58.3% of the students expressed interest in enrolling in Integrated Upper Secondary Education, and 83.3% indicated a

preference for federal public institutions. These results point to the existence of suppressed demand, in which interest in technical education is present but not accompanied by adequate information to support informed decision-making.

This informational gap may be explained by the absence of consistent educational guidance practices in Lower Secondary Education schools, particularly in inland regions. Such behavior is widely described by Queiroz (2020) and Aguiar and Conceição (2009), who argue that young people in public schools, especially in socially vulnerable territories, often lack sufficient repertoire to understand possible educational pathways. The findings of the present study corroborate this pattern, demonstrating that the lack of knowledge does not stem from a lack of interest, but rather from the insufficiency of institutional policies that promote the circulation of qualified information about PTE.

Table 1.

Prior knowledge of 9th-grade students at José Neri de Oliveira Municipal School, Doutor Severiano, Rio Grande do Norte (RN), before the intervention.

Indicator	Response Frequency (N = 26) Percentage		
Knowledge about PTE	No	16	66.7%
Intends to pursue Technical Education	Yes	14	58.3%
Preferred option	Public	20	83.3%
School preparation for the world of work	No	19	79.2%

Source: Authors (2026)

Socioeconomic Profile

The analysis of students' socioeconomic profile revealed a context of vulnerability that directly interferes with the process of career choice (Table 2). Approximately 66.6% of the students live in households with a monthly income below BRL 2,000.00, and the educational attainment of their guardians is predominantly at the levels of incomplete and complete Lower Secondary Education. This context limits young people's access to educational and professional information, as families with lower levels of schooling tend to have a reduced repertoire regarding available educational opportunities, as noted by Lebourg, Coutrim, and Silva (2021).

Furthermore, a strong dependence of students on the school as their primary source of information about their professional future was observed. Thus, the results reinforce that informational vulnerability is a structural condition rather than a circumstantial one, thereby justifying the need for educational interventions specifically aimed at democratizing knowledge about Professional and Technological Education (PTE).

Table 2.

Socioeconomic profile of 9th-grade students at José Neri de Oliveira Municipal School, Doutor Severiano, Rio Grande do Norte (RN), before the intervention.

Indicator	Response	Frequency	Percentage
Household income	Less than one minimum wage	8	33.3%
	Between BRL 1,500 and 2,000	8	33.3%
Predominant educational attainment	Father: Incomplete Lower Secondary Education	9	29.2%
	Mother: Complete Lower Secondary Education	6	25.0%

Source: Authors (2026)

Impact of the Intervention

After the educational intervention, a significant transformation was observed in students' knowledge and perceptions of Professional and Technological Education (PTE). It was found that 79.2% of the participants came to understand fully or partially what PTE is, with 25% stating that they “understand it well” and 54.2% reporting that they “have a general idea.” This improvement represents a substantial change compared to the initial diagnosis and demonstrates the effectiveness of the intervention as a pedagogical tool.

In addition, interest in technical education increased: 16.7% of the students reported a greater desire to enroll in a technical school after the lecture, and 33.3% stated that their opinion of technical institutions had changed positively. The assessment of content clarity was also noteworthy, with 62.5% of the students rating the presentation as “very clear” (Table 3). These results suggest that the intervention methodology, grounded in dialogue, territorial contextualization, and the use of visual materials, facilitated understanding and stimulated students' interest. Similar findings are reported by Silva and Coutinho (2024) and by Pais et al. (2023), who demonstrated that extension activities can act as catalysts for educational choices and expand students' informational repertoire.

Table 3.

Opinions of 9th-grade students at José Neri de Oliveira Municipal School, Doutor Severiano, Rio Grande do Norte (RN), recorded in the second questionnaire (post-intervention).

Indicator	Response	Frequency	Percentage
Do you now know what PTE is?	Yes, I understand it well	6	25.0%
	I have a general idea	13	54.2%
Are you able to explain what Integrated Technical Education is?	No	6	25.0%
	Partially	12	50.0%
Are you interested in studying at a technical school?	I am not interested	5	20.8%

Indicator	Response	Frequency	Percentage
Has your opinion about technical schools changed?	I already had interest before	10	41.7%
	Yes	8	33.3%
	No	13	54.2%
Lecture content	Very clear	15	62.5%
Courses of interest	Partially clear	5	20.8%
	Beekeeping	13	54.2%
	Information Technology	4	16.7%
	Food Technology	3	12.5%

Source: Authors (2026)

Perception of Regional Impact and Sustainability

The intervention also broadened students' perceptions of the role of technical courses in regional development and the promotion of sustainability. It was found that 79.2% of the students came to understand the relationship between Professional and Technological Education (PTE), territorial development, and environmental sustainability. In addition, 66.7% stated that they believe technical education generates sustainable professional and social opportunities within their locality (Table 4).

The themes most frequently mentioned by students, digital innovation, recycling, and conservation of the Caatinga biome, indicate that the intervention not only conveyed information but also fostered critical awareness and recognition of regional demands. This movement aligns with Freirean pedagogy, according to which education should enable individuals to critically understand their reality and participate in its transformation (Freire, 1996). Therefore, the intervention operated not only in the informational domain but also in the formative domain, bringing students closer to the challenges and potentialities of their region.

Table 4.
Students' perceptions of the regional impact of Professional and Technological Education and sustainability

Indicator	Response	Frequency	Percentage
Do you understand the contribution to sustainable development?	Yes, I understand it well	6	25.0%
	I have a general idea	13	54.2%
Do you believe technical education generates sustainable opportunities?	Yes, definitely	16	66.7%
	Maybe	4	16.7%
Most voted project themes	Digital innovation	10	41.7%
	Recycling	4	16.7%
	Conservation of the Caatinga biome	3	12.5%

Source: Authors (2026)

The investigation conducted highlighted the relevance of extension activities as strategic instruments for addressing informational inequalities historically present in basic education. Students' initial lack of knowledge about Professional and Technological Education (PTE) did not reflect disinterest, but rather the absence of systematic career guidance practices capable of supporting informed educational choices. The intervention demonstrated that when qualified information is presented in a dialogical and contextualized manner, students develop a more consistent understanding of the available educational pathways, expanding their repertoire and strengthening their decision-making capacity.

The experience thus confirmed the structuring role of university extension in democratizing access to knowledge. The action developed was not limited to the transmission of content; instead, it functioned as a formative process that promoted conceptual shifts and re-significations in how young people perceive PTE and public educational institutions. Many students who previously lacked concrete references regarding technical education came to recognize its potential as a pathway for social mobility, productive inclusion, and educational continuity. This movement reinforces the importance of the social commitment of the public university as an articulator of knowledge and a mediator between basic education schools and the community.

Another highly relevant aspect was the expansion of students' awareness regarding the relationship between technical education, regional development, and sustainability. The intervention stimulated reflections on local challenges and potentialities, enabling students to interpret PTE as an instrument capable of generating social, environmental, and economic impacts within their territory. This perception aligns with contemporary perspectives on comprehensive education and with Freirean pedagogy, which understands education as a critical and transformative practice.

Thus, the study went beyond the scope of traditional vocational guidance and reached broader formative dimensions, encompassing citizenship, territorial belonging, and social responsibility. The intervention showed that brief informational actions, when methodologically structured and aligned with students' sociocultural context, have a high potential to transform expectations, broaden educational horizons, and contribute to reducing educational inequalities. The study reaffirms the need to permanently integrate career guidance practices into Lower Secondary Education, especially in vulnerable regions, so that young people have access to strategic information that directly influences their academic and professional futures.

Conclusion

The intervention demonstrated that extension activities grounded in dialogue, territorial contextualization, and pedagogical accessibility can serve as effective instruments for expanding the educational repertoire of Lower Secondary Education students. The

experience showed that the lack of knowledge about Professional and Technological Education (PTE) does not stem from disinterest, but rather from historical gaps in career guidance within basic education. By providing qualified, clear, and contextualized information, the study enabled students to better understand the educational possibilities offered by PTE, re-signifying perceptions, strengthening interest in technical education, and recognizing its relevance to regional development.

The study also revealed that closer interaction among public schools, communities, and federal educational institutions constitutes a strategic pathway for reducing informational inequalities and fostering more conscious educational choices. The incorporation of themes such as sustainability, innovation, and territorial valorization reinforced the need for educational practices that connect technical education with students' socio-environmental realities, thereby promoting comprehensive development and a critical reading of the world.

Accordingly, it is recommended that public schools implement permanent career guidance actions starting in the final years of Lower Secondary Education, strengthening access to information about educational pathways. It is also suggested that partnerships between federal institutions and municipal education networks be expanded to develop extension activities that promote the democratization of PTE in vulnerable territories. Future research may deepen longitudinal analyses by following students after the intervention to assess long-term impacts on their academic and professional trajectories. Likewise, the study reaffirms that PTE, when disseminated and understood in its full scope, constitutes an important instrument for social inclusion, educational mobility, and territorial strengthening, confirming the relevance of university extension as a bridge between scientific knowledge and community realities.

REFERENCES

- Aguiar, F. H. R., & Conceição, M. I. G. (2009). Expectativas de futuro e escolha vocacional em estudantes na transição para o ensino médio. *Revista Brasileira de Orientação Profissional*, 10(2), 105–115.
- Brasil. (1996). *Lei nº 9.394, de 20 de dezembro de 1996: Estabelece as diretrizes e bases da educação nacional*. Diário Oficial da União.
- Brasil. (2012). *Resolução CNE/CEB nº 6, de 20 de setembro de 2012: Define as Diretrizes Curriculares Nacionais para a Educação Profissional Técnica de Nível Médio*. Diário Oficial da União.
- Campos, V. B. (2022). A importância das ações de orientação profissional/vocacional aos estudantes da etapa final da educação básica nas escolas públicas brasileiras. *Revista Nova Paideia: Revista Interdisciplinar em Educação e Pesquisa*, 4(3).
<https://doi.org/10.36732/riep.vi.184>

- Freire, P. (1996). *Pedagogia da autonomia: Saberes necessários à prática educativa* (39^a ed.). Paz e Terra.
- Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira. (2024). *Sinopse estatística da educação básica 2023*.
- Lebourg, E. H., Coutrim, R. M. E., & Silva, L. C. (2021). Juventude e transição para o ensino médio: Desafios e projetos de futuro. *Revista Brasileira de Estudos Pedagógicos*, 102(260), 82–98. <https://doi.org/10.24109/2176-6681.rbep.102.i260.4149>
- Melo-Silva, L. L., Munhoz, I. M. S., & Leal, M. S. (2019). Orientação profissional na educação básica como política pública no Brasil. *Revista Brasileira de Orientação Profissional*, 20(1), 3–18. <https://doi.org/10.26707/1984-7270/2019v20n1p3>
- Noronha, A. P. P., & Ottati, F. (2010). Interesses profissionais de jovens e escolaridade dos pais. *Revista Brasileira de Orientação Profissional*, 11(1), 37–47.
- Pais, A. B., et al. (2023). Desafios da educação profissional e tecnológica no Brasil contemporâneo. *Revista Brasileira de Educação*, 28, e280015.
- Queiroz, A. M. (2020). *Construindo pontes entre educação profissional e tecnológica e o mundo do trabalho para alunos concluintes do ensino fundamental* [Dissertação de mestrado, Instituto Federal de Educação, Ciência e Tecnologia do Rio Grande do Sul]. Repositório Institucional do IFRS.
- Ramos, M. N. (2010). *Trabalho, educação e correntes pedagógicas no Brasil: Um estudo crítico da relação entre educação e trabalho*. Cortez.
- Silva, J. A. S. G., & Coutinho, D. J. G. (2024). O papel da educação profissional e tecnológica na formação para o mercado de trabalho no Brasil. *Revista Ibero-Americana de Humanidades, Ciências e Educação*, 10(11), 999–1008. <https://doi.org/10.51891/rease.v10i11.16554>
- Souza, F. C. S., & Silva, E. C. (2022). Políticas educacionais e verticalização da educação profissional e tecnológica no Brasil (séculos XX e XXI). *Vértices*, 24(2), 236–266. <https://doi.org/10.19180/1809-2667.v24n22022p236-266>