Educação em Análise

Article

Graduating students' perceptions of a technical course in production planning and control: factors of satisfaction and challenges[1]

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Abstract

This study analyzed the satisfaction factors and challenges faced by graduating students of the Production Planning and Control (PCP) technical course at a state vocational school. It is a descriptive case study with a mixed-methods approach, conducted with 50 students using a structured questionnaire containing closed-ended questions on an ordinal scale and open-ended items. The results indicated a predominance of young people aged 18 to 19, whose enrollment in the course was motivated by interest in the area and a high level of overall satisfaction with the course, highlighting the clarity of explanations, content mastery, and accessibility of teachers. However, perceptions of insufficient infrastructure were identified for some students, along with neutral or dissatisfied evaluations of institutional support and demands for a closer connection between theory and practice. The study proposes actions such as guidance in course selection, expansion of active methodologies and practical experiences, improvement of infrastructure, and strengthening of student listening spaces as strategies for the continuous improvement of the PCP technical course.

Keywords: Production planning and control; vocational and technological education (VTE); student satisfaction; quality of education.

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Percepciones de los estudiantes que se gradúan sobre un curso técnico de planificación y control de la producción: factores de satisfacción y desafíos

Resumen

Este estudio analizó los factores de satisfacción y los desafíos que enfrentan los estudiantes egresados del curso técnico de Planificación y Control de la Producción (PCP) en una escuela vocacional estatal. Se trata de un estudio de caso descriptivo con un enfoque de métodos mixtos, realizado con 50 estudiantes mediante un cuestionario estructurado que contiene preguntas cerradas en una escala ordinal y preguntas abiertas. Los resultados indicaron un predominio de jóvenes de 18 a 19 años, cuya matriculación en el curso estuvo motivada por el interés en el área y un alto nivel de satisfacción general con el curso, destacando la claridad de las explicaciones, el dominio del contenido y la accesibilidad del profesorado. Sin embargo, se identificaron percepciones de infraestructura insuficiente para algunos estudiantes, junto con evaluaciones neutrales o insatisfechas del apoyo institucional y demandas de una conexión más estrecha entre la teoría y la práctica. El estudio propone acciones como la orientación en la selección de cursos, la expansión de metodologías activas y experiencias prácticas, la mejora de la infraestructura y el fortalecimiento de los espacios de escucha estudiantil como estrategias para la mejora continua del curso técnico de PCP.

Palabras clave: Planificación y control de la producción; educación vocacional y tecnológica (EVT); satisfacción estudiantil; calidad de la educación.

Percepções de estudantes concluintes sobre um curso técnico em planejamento e controle da produção: fatores de satisfação e desafios

Resumo

O estudo analisou os fatores de satisfação e desafios de estudantes concluintes do curso técnico em Planejamento e Controle da Produção (PCP) em uma escola estadual de educação profissional. Trata-se de um estudo de caso descritivo, com abordagem qualiquantitativa, realizado com 50 discentes, por meio de questionário estruturado contendo questões fechadas em escala ordinal e itens abertos. Os resultados indicaram predominância de jovens entre 18 e 19 anos, sendo seu ingresso no curso motivado pelo interesse na área e elevado nível de satisfação geral com o curso, com destaque para a clareza das explicações, o domínio de conteúdo e a acessibilidade dos docentes. Identificaram-se, entretanto, percepções de infraestrutura insuficiente para parte dos estudantes, avaliações neutras ou insatisfeitas quanto ao atendimento institucional e demandas por maior aproximação entre teoria e prática. O estudo propõe ações de orientação na escolha do curso, ampliação de metodologias ativas e experiências práticas, aperfeiçoamento da infraestrutura e fortalecimento de espaços de escuta estudantil como estratégias para a melhoria contínua do curso técnico em PCP.

Palavras-chave: Planejamento e controle da produção; educação profissional e tecnológica-EPT; satisfação discente; qualidade de ensino.

Introduction

Professional and Technological Education (PTE) has strengthened as a strategic field in the face of productive transformations and the increasing demand for technical qualification, consolidating itself as a pathway for social inclusion and economic development. As highlighted by Silva and Coutinho (2024), by aligning teaching with labor market needs, PTE expands real opportunities for professional insertion, allowing young people and adults—especially those belonging to vulnerable groups—to access formal employment and improve their living conditions.

In this context, courses such as the Technical Program in Production Planning and Control (PPC) become fundamental for preparing professionals capable of operating in dynamic industrial environments, which require not only mastery of management tools but also analytical capacity to deal with constant variations in production processes. According to Lage Junior (2019), Chiavenato (2022), and Souza and Reis Filho (2024), PPC constitutes a set of essential managerial activities for coordinating productive resources, monitoring deviations, and enhancing results, making it an indispensable strategic tool for organizational competitiveness. Given this relevance, technical training in this area represents a direct response to the demands of the contemporary productive sector, making the course a learning space that articulates technical knowledge and practical competencies fundamental to the labor market.

Thus, understanding how students experience this training is essential, as the academic experience and student satisfaction are not limited solely to the taught content; they are influenced by multiple factors, such as daily interactions, coexistence in the academic environment, the relationship between teachers and peers, teaching methods, and the support received (Ribeiro; Correia; Campos, 2021). Furthermore, according to these authors, although personal factors appear to be less relevant, the lack of student emotional

involvement with the educational process can compromise their interest and lead to demotivation.

Recent studies have investigated the perception of vocational education students from different perspectives, such as the entry of graduates from technical courses in occupational safety and information technology into the labor market (Rodrigues; Quadros, 2023; Silva; Melo, 2026), student financial aid availability (Januário; Geglio, 2025), student perception regarding the brand of the federal technological education institution where they study (Tavares; Tacconi; Tacconi Neto, 2023), and understanding regarding quality of life (Alves; Pereira, 2022). However, research specifically articulating the satisfaction factors and challenges perceived by graduating students of technical courses in Production Planning and Control (PPC) within the context of the state education network remains scarce.

Given this gap, and considering both the strategic relevance of PPC for the industrial sector and the role of PTE in training qualified professionals, this article aims to understand the factors that influence student satisfaction in the Technical Course in PPC at a state technical school, in order to contribute to the improvement of pedagogical practices and the strengthening of this educational modality.

Professional and Technological Education (PTE)

Professional and Technological Education (PPC) in Brazil is governed by the Law of Guidelines and Bases of National Education (LDB), Law No. 9,394/1996, which, in its recent provisions, reinforces the importance of integrating secondary education with preparation for the workforce. According to the LDB, middle-level technical professional education must maintain an articulation with the productive sector, ensuring that the curriculum is consistent with socio-technological transformations and local market demands (Brasil, 1996). In this context, PTE is not limited solely to technical training but seeks, as Frigotto, Ciavatta, and Ramos (2005) argue, the integration of labor, science,

and culture, aiming for the formation of a critical citizen capable of facing the challenges of the contemporary world.

Souza and Benites (2021) emphasize that the trajectory of PTE in Brazil is marked by a historical movement of advances and setbacks; that is, it is not uniform, featuring a tense coexistence between perspectives focused on vocational training and projects that advocate for integral and omnilateral human formation. The authors highlight that, although there have been periods of expansion and pedagogical valorization, PTE still faces the challenge of overcoming the legacy of a merely instrumental education. For these authors, understanding this panorama is essential for evaluating the effectiveness of current public policies and the impact of educational institutions on the technical and social preparation of students in the face of constant mutations in the economic scenario (Souza; Benites, 2021).

From this perspective, it is evident that transformations in the teaching and learning process demonstrate the need to build technical education with a distinct profile, especially since the labor market has been gradually expanding job offerings. In this scenario, the search for technical-vocational courses in various fields of knowledge emerges as an incentive for educational institutions to offer the public a broader set of choices (Redin et al., 2015).

Thus, PTE comes to be understood not only as the provision of technical courses but as a strategic modality to articulate basic education, professional training, science, and technology, contributing to the democratization of access to knowledge. Among the strategies adopted in this process, the offering of secondary education integrated with professional education stands out, designed to overcome the long-standing separation between academic formation and preparation for work.

Consequently, Professional and Technological Education (PTE) plays a relevant role in society, as it contributes to the formation of individuals capable of mobilizing skills, knowledge, values, and attitudes when faced with situations in both personal and professional life (Campolin; Raymundo, 2022).

Given this context, understanding how students experience PTE—especially in integrated technical courses—becomes essential. Evaluating student satisfaction, motivation, perception of theory and practice, the quality of teaching practices, and infrastructure allows for the identification of how students assess their formative experience and to what extent the course has met their educational expectations and needs.

Student Satisfaction in Educational Services

Student satisfaction in educational services involves the analysis of students' perceptions, expectations, and experiences regarding the quality of education, constituting an essential theme for understanding and improving the performance of educational institutions. According to Kotler (2018), satisfaction corresponds to the feeling of pleasure or frustration that arises when an individual compares expected performance with the effectively obtained result. Redin et al. (2015) complement this by stating that evaluating the level of student satisfaction within the school environment is fundamental, as it allows for monitoring the performance of adopted strategies and verifying whether defined objectives are being adequately achieved.

For Ribeiro, Correia, and Campos (2021), in the current educational context—characterized by challenges such as dropout rates and market competitiveness—student perceptions and feelings become decisive elements for guiding institutional actions. As stated by Lizote, Lana, and Verdinelli (2012), knowing satisfaction levels is essential for organizations to effectively manage the maintenance of adequate quality conditions in their products or services, as well as the results obtained with the target audience. According to Reis and Vicente (2023), understanding this student satisfaction is essential, as it allows for the identification of both aspects that need improvement and those that already fully meet students' expectations within the institution.

When students experience high levels of satisfaction, they tend to demonstrate greater motivation to study, which also contributes to retention,

thereby reducing the need for intensive recruitment efforts (Ribeiro; Correia; Campos, 2021). Furthermore, according to these authors, student satisfaction is strongly related to classroom dynamics, particularly the manner in which knowledge is transmitted and the support offered to the student. Alves (2003) adds that student satisfaction is linked to the quality of interactions with professors and administrators, classroom coexistence, and the education provided.

According to Redin et al. (2015), ensuring the quality of teaching and learning contributes to the development of a critical stance that favors student retention in the educational system, reducing failure and dropout rates. Simultaneously, it promotes the continuous improvement of pedagogical, technical, and administrative processes in the permanent pursuit of excellence. In this sense, Rossato, Pinto, and Müller (2020) emphasize that understanding the reality experienced by students is fundamental to the institutional planning process; an effective way to measure their satisfaction level consists of consulting them directly to identify the factors they consider relevant.

In light of this, student satisfaction ceases to be merely a general indicator of institutional quality and becomes a strategic element for understanding how different formative proposals are experienced in specific contexts. Consequently, the analysis of these perceptions becomes even more strategic in technical courses, such as Production Planning and Control (PPC), where student perception regarding the practical applicability of content and the quality of laboratory infrastructure are determining factors for their future entry into the professional market.

Technical Program in Production Planning and Control (PPC)

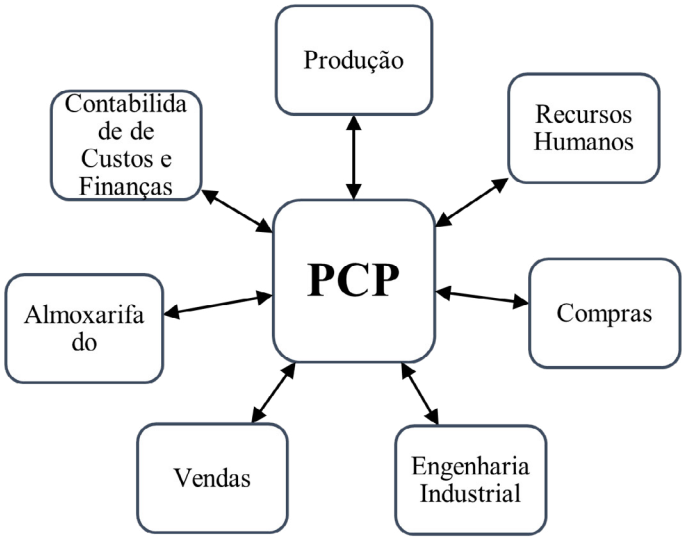
The Technical Program in Production Planning and Control (PPC) aims to train professionals capable of operating at the strategic core of industrial operations. The National Catalog of Technical Courses (Brasil, 2020) highlights that the PPC technician works in the organization and control of productive

processes, applying methods for planning, inventory analysis, and the monitoring of materials and indicators, in addition to utilizing continuous improvement tools to promote efficiency and quality in industrial operations.

According to Slack, Chambers, and Johnston (2018), PPC is responsible for reconciling supply and demand, ensuring that operational processes occur in an effective and efficient manner. In a complementary view, Martins and Laugeni (2015) state that PPC offers a systemic perspective of productive processes, coordinating the planning, scheduling, and control of resources to ensure efficiency and alignment between the stages of manufacturing.

In this context, Chiavenato (2022) presents PPC as an integrating core of operations, establishing direct connections with sectors such as finance, production, industrial engineering, purchasing, sales, cost accounting, human resources, and warehousing. These interfaces allow PPC to articulate information and coordinate flows between areas, ensuring that the production process is planned and controlled efficiently, aligned with organizational demands and market needs. This correlation is presented in Figure 1 below.

Figure 1 - Interconnections of Production Planning and Control with other business areas



Source: Adapted from Chiavenato (2022)

Chiavenato (2022) explains that production planning and control has a dual purpose: on one hand, it acts directly on the production means to increase operational efficiency; on the other, it ensures that established production objectives are met, guaranteeing greater effectiveness in organizational results. Cardoso (2021) states that, when well-managed, PPC generates significant benefits for the entire organization, as it integrates processes and information with a focus on efficiency and meeting demands. According to the author, PPC functions as the central core of operations—the heart of the industry—since nothing is produced or purchased without its coordination.

Thus, it is evident that the PPC technician does not merely execute operational tasks but acts as a link between sectors, structuring and coordinating the production flow and integrating processes, information, and decisions. Therefore, school training must articulately balance theoretical content and practical experiences, concretely preparing the student for the challenges and demands of the contemporary manufacturing environment.

Research Characterization

The present research is characterized as descriptive, seeking to detail and interpret the investigated reality (Gil, 2022; Martins; Mello; Turrioni, 2013). A qualitative-quantitative approach (mixed method) is adopted, which allows for the integration of numerical data analysis with an in-depth understanding of the participants' perceptions (Creswell; Clark, 2013). The strategy employed is a single case study, ideal for investigating delimited phenomena within their real-life contexts (Yin, 2015).

Regarding the concept of satisfaction adopted in the research, it was operationalized based on Kotler and Keller (2018) and Redin et al. (2015), being translated into measurable items through a 5-point ordinal scale (ranging from "totally dissatisfied" to "totally satisfied"). This scale was applied to questions such as: overall satisfaction with the course, clarity of teachers' explanations, provided infrastructure, and institutional service. Furthermore, specific

questions regarding expectation versus perceived reality were included, as well as open-ended items to capture unforeseen factors, as recommended by Ribeiro, Correia, and Campos (2021). Chart 1, below, details the complete structure of the data collection instrument applied to the students.

The questionnaire was structured into thematic blocks totaling 21 questions. Each block investigated specific dimensions of the formative experience, using closed questions on a 5-point ordinal scale (varying, depending on the item, from "very dissatisfied" to "very satisfied," "never" to "always," or "totally dissatisfied" to "totally satisfied") and open questions for collecting in-depth perceptions.

Chart 1 – Structure of the questionnaire applied to students graduating from the technical program in PPC

Investigated Block	Questionnaire Question
Respondent Profile	1. Age group 2. Gender
Motivation for Course Choice	1. What was the main reason for choosing this course?
Overall Satisfaction with the Course	1. What is your level of satisfaction with the course taken at the institution? 2. How do you evaluate your motivation to participate in the technical activities of the course? 3. How do you evaluate the relationship between theory and practice in the course? 4. Did the course contribute to your personal and professional growth? 5. How do you evaluate your learning during the course? 6. If you could go back in time, would you take this same technical course again? 7. How do you evaluate the level of difficulty of the course? 8. Leave a comment about your satisfaction/dissatisfaction regarding the technical course completed.

(Continued)

(Continued)

Quality of Teaching and Pedagogical Practices	1. How do you evaluate the clarity of the teachers' explanations? 2. How do you evaluate the practices and methodologies used by technical teachers in the classroom? 3. How do you evaluate the relevance of the content taught? 4. How do you evaluate the subject matter expertise of the technical course teachers? 5. Were the teachers accessible for answering questions?
School and Infrastructure	1. How do you evaluate the infrastructure provided for the course (classrooms, laboratories, equipment)? 2. What is your level of satisfaction regarding the service and support offered by the school? 3. Do you feel proud to be a student at this technical school? 4. Would you recommend the technical course taken at this school to someone else? 5. Leave a message or information you deem interesting regarding the course taken at the institution.

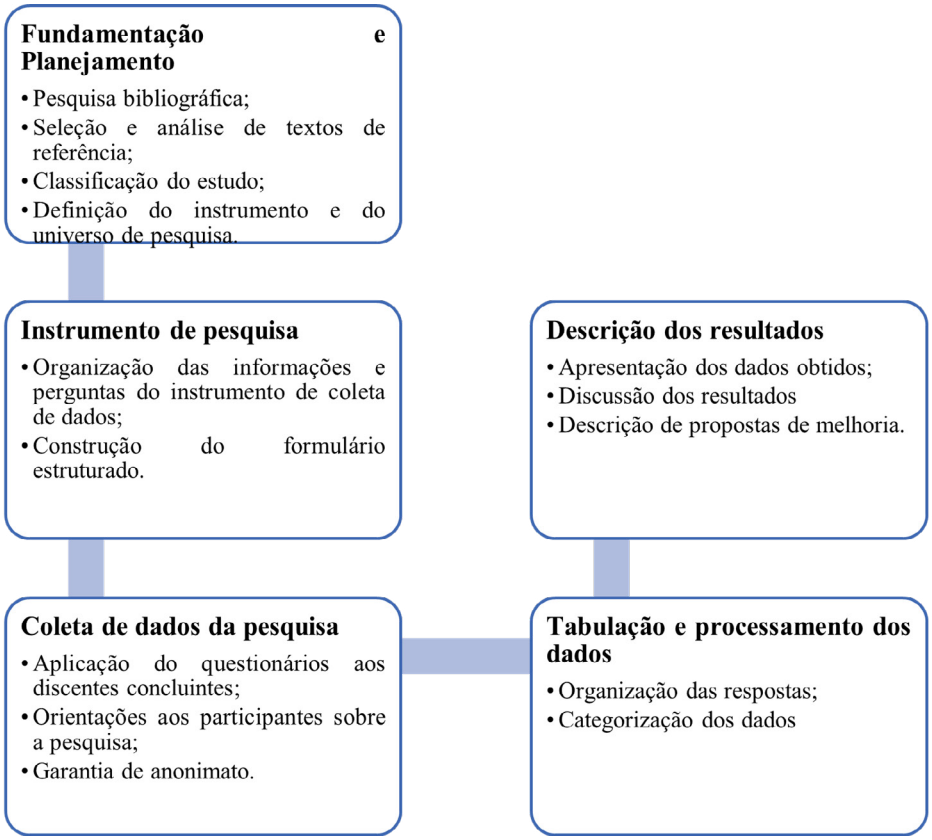
Source: Authors (2026)

As detailed in Chart 1, the questionnaire included open-ended questions (items 11 and 21). For the analysis of these qualitative responses, thematic content analysis was adopted, as proposed by Bardin (2016) and Braun and Clarke (2006). The procedure consisted of a thorough reading of the responses, the coding of units of meaning, and the grouping of these codes into thematic categories (e.g., suggestions for improvement, criticisms of infrastructure, perceptions of teaching). This analysis allowed for a deeper understanding of the investigated phenomena, the identification of suggestions for improvement pointed out by students, and the recognition of recurring perceptions regarding infrastructure, teaching practices, and institutional support.

Finally, Figure 2 summarizes the methodological path, structured into five stages. The first stage comprised the theoretical foundation, planning, and delimitation of the research universe. Subsequently, the research instrument (a structured form) was developed. Data collection took place over two days with graduating students from two PPC classes, ensuring anonymity. Lastly, the

data were processed, categorized, and analyzed, resulting in the description of evidence and proposals for improvement.

Figure 2 - Research flowchart



Source: Authors (2026)

Field of Study

The study was conducted at a state vocational technical school that offers the integrated middle-level technical program in PPC. The institution, located in the metropolitan region of Natal, Rio Grande do Norte, has been in operation for four years. The research universe comprised 53 enrolled and graduating students. However, the final sample consisted of 50 respondents (94.3% of the total), corresponding to the students present in the classroom at the time the instrument was administered.

Prior to the administration of the questionnaire, the purpose and importance of the study for the academic community were explained in the

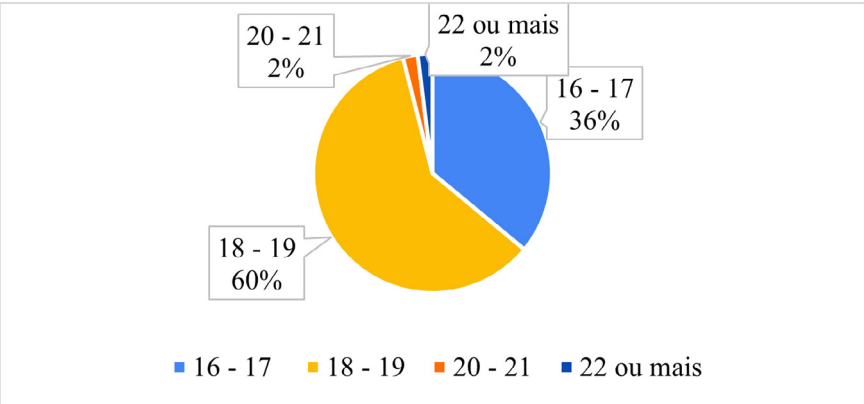
classroom. Furthermore, the relevance of sincere responses consistent with each student's individual experience was emphasized, ensuring the confidentiality of the information.

Student Profile

Initially, with the purpose of evaluating the internal consistency of the research instrument, McDonald's Omega (ω) test was performed using JASP software (version 0.95.4.0). For a 95% confidence level, a value of 0.861 (0.804–0.918) was obtained, indicating excellent reliability of the instrument and suggesting that the items consistently measure the students' degree of satisfaction.

The analysis of the results is based on data collected from graduating students of the technical program in Production Planning and Control (PPC) in 2025. Regarding the age group, there was a predominance of young people between 18 and 19 years old (60%), followed by those between 16 and 17 years old (36%). The profiles aged 20 to 21 and over 22 years old showed a residual participation of 2% each, as detailed in Figure 3. Regarding gender, the sample was balanced: 25 respondents identified as men and 23 as women. Additionally, one participant identified as non-binary and another preferred not to disclose, totaling the 50 respondents of the study.

Figure 3 - Age range of respondents



Source: Authors (2026)

The predominance of young people between the ages of 18 and 19 (60%) is aligned with the typical profile of Professional and Technological Education in Brazil, which primarily serves students in transition to the labor market (Souza; Benites, 2021). However, this data also creates a tension within the literature, as it indicates that the majority of graduates are still very young, which may imply little prior experience in the production field. This scenario, as cautioned by Frigotto, Ciavatta, and Ramos (2005), requires the school to not only provide technical training but also develop a critical understanding of the world of work in students—an aspect that is not always prioritized in traditional technical curricula.

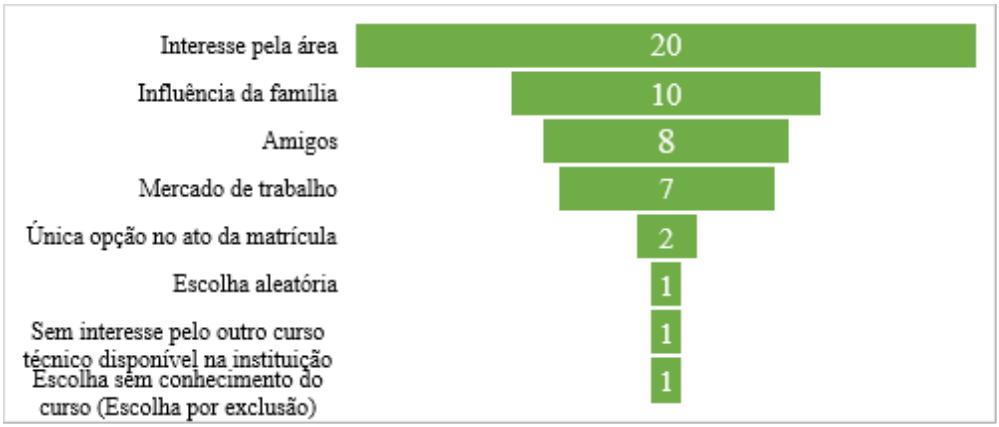
Course Choice

One of the initial inquiries of the research sought to identify the motivations for entering the program: "What motivated you to choose this course?". The results, detailed in Figure 4, indicate that interest in the field is the predominant factor, accounting for 40% (20 responses). This is followed by family influence, with 20% (10 respondents); the presence of friends in the course, with 16% (8 responses); and labor market perspectives, with 14% (7 responses). Isolated cases (between 1 and 2 respondents) mentioned that the course was the only option at the time of enrollment or that the choice was made by exclusion or randomly.

Upon analyzing these motives, it is observed that although genuine interest in the field is the primary driver, a significant portion of students enrolls due to external or circumstantial motivations. This finding creates a tension with the perspective of Kotler and Keller (2018) regarding satisfaction as the result of the comparison between expectation and performance: students who enroll without clarity about the course may have lower expectations and, paradoxically, present high levels of satisfaction even when faced with a program that may have potential weaknesses. As highlighted by Redin et al. (2015), prior professional guidance is essential to align expectations and avoid

frustrations throughout the academic trajectory. The relevance attributed to the labor market as a motivation suggests that, despite an occasionally unplanned entry, students recognize PPC as a real opportunity for employability.

Figure 4 - Reason for choosing the course



Source: Authors (2026)

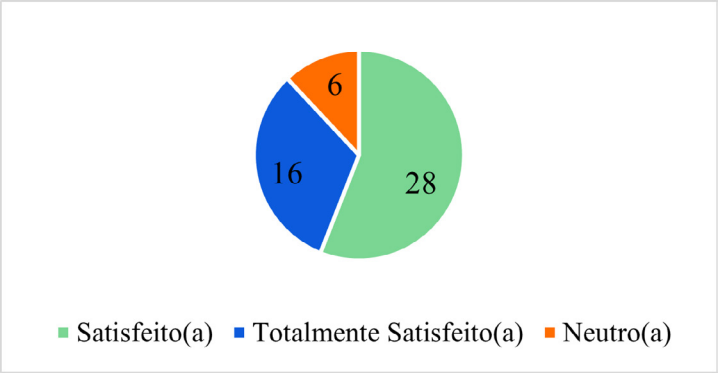
Satisfaction with the course and perception of teaching and learning

When questioned about their overall satisfaction level with the technical program in PPC, the results reveal a favorable scenario. It was observed that the entirety of the respondents was distributed among the following categories: "satisfied" with 28 responses, followed by "totally satisfied" with 16, and "neutral" with 6. There were no mentions of the "dissatisfied" or "totally dissatisfied" levels. This data is significant, as it indicates that, despite the individual or technical challenges encountered throughout the training, the final perception of the educational service provided is broadly positive.

According to the quantitative analysis, the majority of students declared themselves "satisfied" or "totally satisfied," demonstrating that initial expectations were, for the most part, met, as suggested by the literature of Kotler and Keller (2018) cited previously. In the case of this course, the absence of dissatisfaction rates suggests that the state network has succeeded in

delivering a curriculum consistent with the students' needs, even though the PPC course is new to the analyzed institution.

Figure 5 - Satisfaction with the PCP course

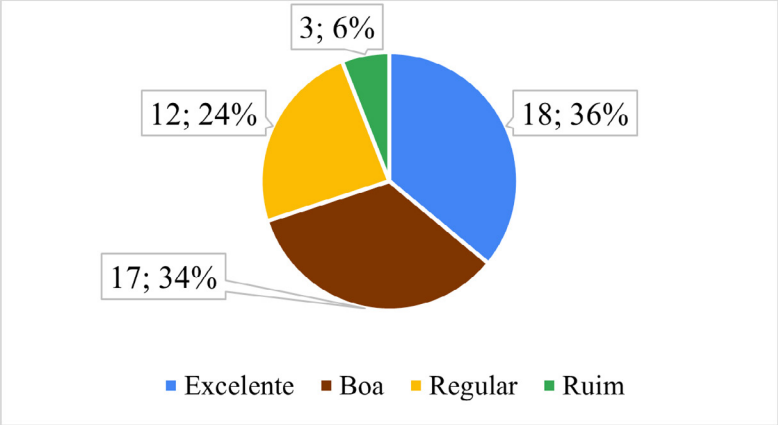


Source: Authors (2026)

Continuing the analysis, it is interesting to identify and understand the perception regarding the level of academic demand of the course. The data reveal a satisfactory scenario, where the majority of respondents (96%) classified the difficulty as adequate (76%), easy (16%), or very easy (4%), versus only 4% who reported it as difficult. This suggests that the pace of the classes and the depth of the content are aligned with the students' absorption capacity.

Another item analyzed was the relationship between theory and practice in the course (Figure 6). The results demonstrate that most students evaluate this aspect positively: 36% (18 students) classify it as excellent and 34% (17 students) as good. Meanwhile, 24% (12 students) consider this integration regular and 6% (3 students) define it as poor. The analysis of these data reveals that, although 70% of the class validates the handling of the subjects, there is a portion that expresses dissatisfaction. Thus, the less favorable evaluations serve as an indicator of the need for strategies that bring theoretical concepts closer to real experiences within a business environment, ensuring greater professional confidence for the graduates.

Figure 6 - Relationship between theory and practice in the course



Source: Authors (2026)

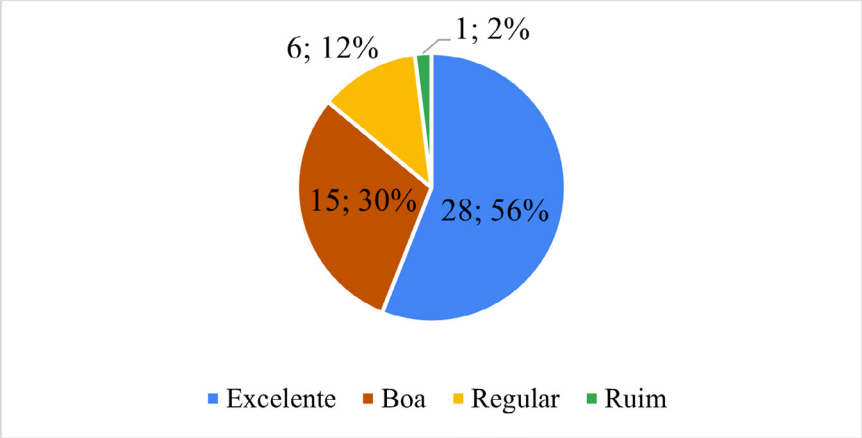
In general, the findings align with the concept of satisfaction presented by Kotler and Keller (2018), as well as the points highlighted by authors Ribeiro, Correia, and Campos (2021) and Reis and Vicente (2023), in which student satisfaction predominates, further configuring a favorable scenario for student retention and engagement. Furthermore, as postulated by Lizote, Lana, and Verdinelli (2012), these satisfaction levels are fundamental for the school organization to ensure the maintenance of the quality of its services toward its target audience. However, the absence of general dissatisfaction rates (0%) is a positive data point, yet it also warrants attention. According to Souza and Benites (2021), Brazilian PTE still carries a legacy of instrumental training, in which high satisfaction rates may mask pedagogical weaknesses. Moreover, the 30% of students who evaluate the theory-practice relationship as regular or poor (24% and 6%, respectively) echo the criticisms of Frigotto, Ciavatta, and Ramos (2005) regarding the historical difficulty of PTE in overcoming the separation between academic education and training for work.

Quality of Teaching and Pedagogical Practices

The evaluation of teaching quality highlights positive perceptions among the students of the technical program in PPC, as shown in Figure 7. Regarding the clarity of the teachers' explanations, a significant predominance

of favorable evaluations is observed: 56% of respondents classified this dimension as excellent and 30% as good, totaling 86% satisfaction. Only 12% indicated a regular understanding, and 2% classified it as poor, suggesting that teaching communication is a strong point of the course. This result reinforces the effectiveness of content transmission strategies and the teachers' ability to make explanations accessible and understandable for the majority.

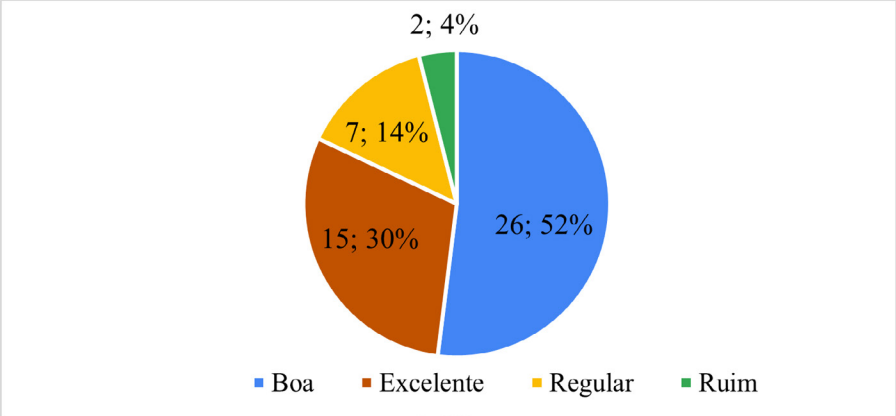
Figure 7 - Clarity in teacher explanations



Source: Authors (2026)

With regard to the practices and methodologies used in the classroom (Figure 8), the perception is also predominantly positive. Approximately 30% consider the methodologies excellent, while 52% evaluate them as good. Combined, these percentages represent an 82% approval rate. However, 14% of those interviewed classified the practices as regular and 4% as poor, indicating the existence of a group that sees possibilities for improvement, especially regarding the diversification of methodological strategies, the inclusion of expanded practical activities, or greater contextualization with real-life situations in the field of Production Planning and Control.

Figure 8 - Practices and methodologies used by teachers in the classroom.



Source: Authors (2026)

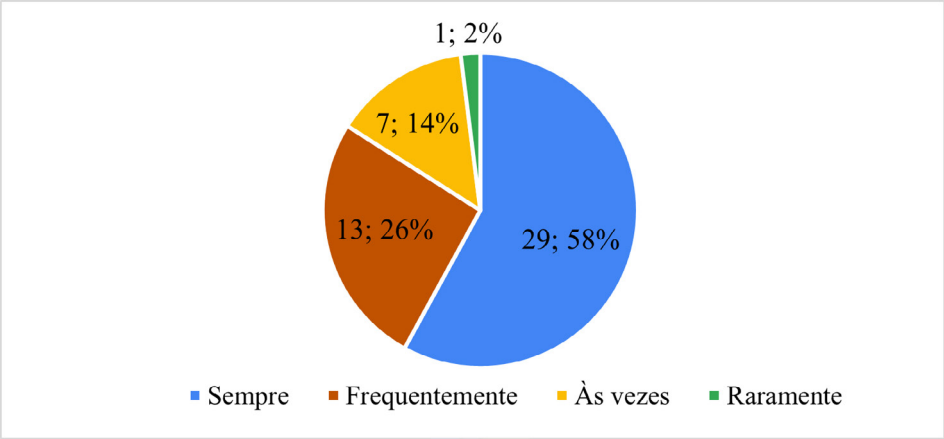
One question posed to students concerned the relevance of the content taught in the classroom. A total of 32% stated that the contents are very relevant, while 56% classified them as relevant; thus, 88% perceive a significant alignment between the topics addressed and the competencies required in technical training. Only 12% evaluated the content as reasonable, signaling that, although small, a segment of the classes recognizes the need for curricular adjustments or deeper exploration of specific areas.

Another analysis conducted pertained to the subject matter expertise demonstrated by the teachers in the classroom, which stands out expressively. The majority of students (74%) evaluated the teachers' expertise as excellent, followed by 18% who assigned a good rating. Only 8% considered the expertise regular. These data point to a technically prepared teaching staff, capable of articulating theory and practice with confidence and reliability, which contributes directly to building a consolidated formative experience.

Finally, the accessibility of teachers for answering questions (Figure 9) reinforces the perception of a welcoming pedagogical environment that fosters learning. For 58% of the students, the teachers are always accessible, while 28% stated that this occurs frequently. Combined, these percentages result in 86% positive evaluations. Only a small portion reported sporadic accessibility,

indicating that teacher availability is recognized as a significant element of support during the formative process.

Figure 9 - Access to teachers for the technical course



Source: Authors (2026)

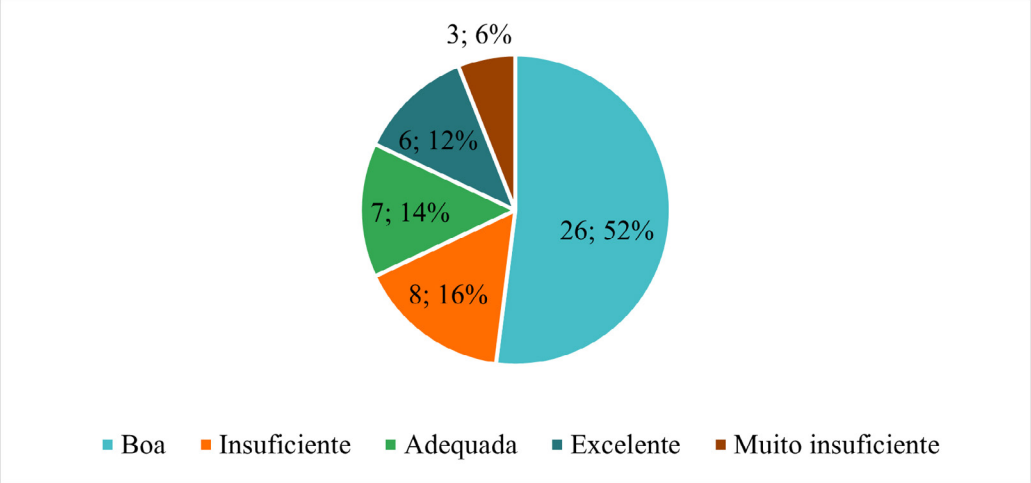
The results obtained in this analysis block generally evidence excellent student evaluations regarding the clarity of explanations, subject matter expertise, and teacher accessibility, reinforcing the importance of classroom interactions in building student satisfaction, as argued by Alves (2003) and Ribeiro, Correia, and Campos (2021). When students perceive that teachers have mastered the content, utilize appropriate methodologies, and remain available to clarify doubts, the formative experience tends to be evaluated more positively, contributing to motivation, improvement, learning, and retention in the course.

School and Infrastructure

Regarding the infrastructure provided for the course (Figure 10), consisting of classrooms, laboratories, and equipment, it is observed that 52% of the students classify this aspect as good, while 14% consider it adequate and 12% as excellent, totaling 78% favorable evaluations. In contrast, 16% consider it insufficient and 6% evaluate it as very insufficient, indicating that a significant portion experiences structural limitations that may impact the full development of practical activities and the use of technological resources. This contrast

suggests that, although the institution possesses a functional infrastructure, it does not yet homogeneously meet the expectations of all students, especially those who require more equipped environments for specific technical activities related to PPC.

Figure 10 - Infrastructure provided for the course



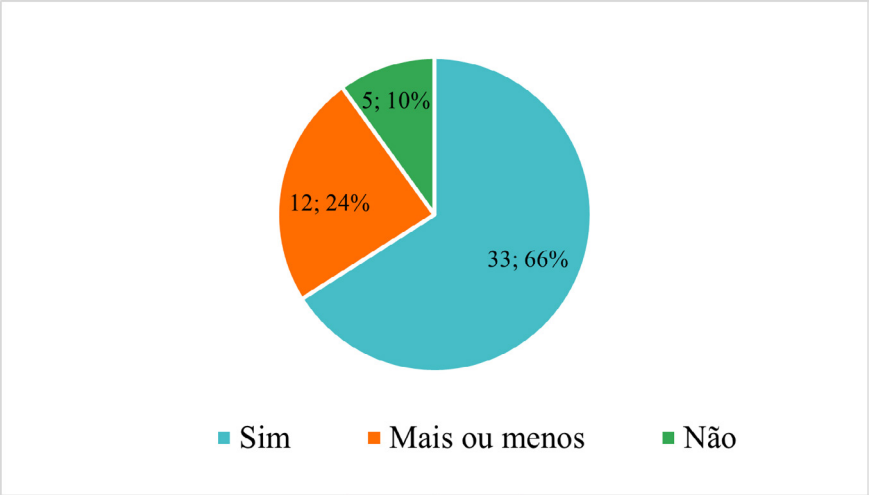
Source: Authors (2026)

Regarding the service and support offered by the institution, a more balanced distribution between positive and neutral evaluations is observed. Among the participants, 38% claim to be satisfied, while 38% maintain a neutral position, and only 8% state they are totally satisfied. Conversely, 8% report being dissatisfied and 8% are totally dissatisfied. This cluster of neutral responses suggests that, although institutional support is not perceived as a critical problem, it does not stand out as a strong point either. This percentage may indicate that the support provided by the school is not perceived as central to the students' formative experience. It is possible that students lack clarity regarding the roles, support channels, and institutional services available or what they should expect, which contributes to indeterminate responses. On the other hand, the 16% who are dissatisfied (combining "dissatisfied" and "totally dissatisfied") suggest the existence of a subgroup with specific needs, such as unresolved academic difficulties or bureaucratic issues. This finding points

toward the convenience of focused interventions rather than universal reforms in institutional service.

The sense of belonging was also investigated through the question regarding pride in being a student at the technical school (Figure 11). The results demonstrate a significant level of institutional identification: 66% of students state they feel proud, while 24% report feeling "more or less" proud, and only 10% answered "no." These data reveal a positive institutional image (66%); however, they warrant a more careful interpretation. The high sense of institutional pride (66%) may derive not only from the quality of the course itself and the school's activities but also reflect the feeling of belonging to a socially valued professional category: that of a Production Planning and Control technician.

Figure 11 - Pride in being a student at the technical school



Source: Authors (2026)

Finally, the indicator regarding the recommendation of the course to others reinforces the overall positive view of the school. A significant majority (80%) state that they would recommend the course to others, while 14% responded "maybe," and only 6% would not recommend it. This favorable inclination toward recommendation demonstrates that, despite limitations in structural aspects and support services, the formative experience as a whole is meaningful enough

for the majority of students to endorse both the PPC course and the institution. However, this high recommendation rate warrants a cautious interpretation. The willingness to recommend the course may be more closely associated with perceived labor market benefits—such as employability, professional recognition, and social status—than necessarily with pedagogical quality. Thus, it is possible that students recommend the course for the professional returns it provides, rather than exclusively for the excellence of teaching practices or the institutional support received. This distinction is crucial to avoid overestimating satisfaction indicators as direct evidence of formative quality.

The results concerning infrastructure and institutional support align with the discussions by Redin et al. (2015) and Rossato, Pinto, and Müller (2020), who understand student satisfaction as the result of a combination of academic, pedagogical, and administrative factors. Although the majority of responses point to favorable evaluations, the presence of a relevant portion of students who perceive structural limitations and express neutral positions regarding support reveals the need to improve material conditions and service, in order to consolidate the perceived quality of the educational service offered.

Improvement Proposals

Based on the results obtained, it was possible to outline several improvement proposals aimed at refining the technical program in PPC and the students' formative experience. These hypotheses are organized into four main pillars: guidance for course selection, qualification of pedagogical practices, infrastructure enhancement, and strengthening student support.

Regarding professional guidance, the data revealed that some students entered the course motivated by the influence of family, friends, or a lack of other enrollment options, without fully understanding the duties of a PPC technician. As a suggestion for pedagogical management, the introduction of career fairs, meetings with alumni, informative materials, or orientation sessions that present PPC to new students is recommended, as well as a greater

presence of explanatory posts about the course objectives on the institution's social media. Such actions can transform students who entered due to a lack of options into engaged individuals who are aware of potential professional fields and understand the connections between work areas as presented in Figure 1 and mentioned by Chiavenato (2022).

In relation to pedagogical practices, although the majority of respondents positively evaluated the clarity of explanations, the methodologies used, and the relationship between theory and practice, a small portion perceives these dimensions only as regular or unsatisfactory. In light of authors such as Redin et al. (2015) and Campolin and Raymundo (2022), who advocate for the centrality of teaching quality in student satisfaction, it is suggested to expand the use of active methodologies, integrative projects, case studies, and activities that bring the content closer to real-life situations in the PPC field. This contributes to the construction of technical and analytical competencies aligned with market demands. The inclusion of more frequent technical visits, formative lectures, and mini-workshops on the application of industry-specific tools in industrial and business contexts will also significantly strengthen these actions.

Regarding infrastructure and institutional support, the results indicate that while most consider physical conditions to be good or adequate, a significant fraction of students evaluates the infrastructure as insufficient or very insufficient, in addition to expressing neutral or dissatisfied views on service. In this sense, it is proposed that school management plans the gradual update of laboratories, equipment, and technological resources used in course activities, as well as the improvement of communication and service channels for students, seeking to make institutional support more agile, accessible, and visible to the student body.

Considering the high rates of pride in being a student at the school and the strong willingness to recommend the course, it is recommended to strengthen permanent mechanisms for student feedback and participation. This could include semester-based student satisfaction surveys or, for example,

establishing an internal academic evaluation commission to analyze institutional and pedagogical practices and thus foster continuous improvement. Another action involves creating permanent student leadership programs, such as course ambassador groups, thematic technical clubs, and student participation in institutional visibility initiatives. Meetings with class representatives and public feedback (via school bulletin boards, social media, or direct conversations with students) regarding improvements implemented based on student opinions will significantly increase the satisfaction of the school community.

These initiatives strengthen the sense of belonging and expand opportunities for socio-emotional and technical development, contributing to the maintenance of high satisfaction levels and the continuous improvement of pedagogical and administrative processes.

Chart 2 below presents a summary of the improvement proposals discussed thus far.

Chart 2 – Summary of Improvement Proposals

Identified Weakness	Related Reference	Proposed Improvement	Objective
Some students enroll without knowing the functions of a PPC technician (60% motivated by external factors).	Kotler (2018); Redin et al. (2015); Chiavenato (2022).	Organize career fairs, alumni meetings, promotional materials (folders, videos), and orientation events for new students; expand course-related communication on the school's social media.	Reduce enrollment by exclusion and align student expectations with the actual course profile from the moment of registration.
Regular or unsatisfactory perception regarding the relationship between theory and practice (30% rated as regular/poor).	Rossato, Pinto, and Müller (2020); Redin et al. (2015).	Update and modernize laboratories and equipment; acquire software and technological resources used in the PPC field; improve the control and scheduling of technical visits.	Bridge the gap between theory and practice, allowing students to visualize theoretical integration within a real factory environment.

(Continued)

(Continued)

Institutional support with 16% dissatisfied/ totally dissatisfied and 38% neutral.	Ribeiro, Correia, and Campos (2021).	Improve service and communication channels; create student response protocols; increase the presence of the pedagogical team during guidance sessions.	Increase satisfaction with school support and services.
Limited student participation in institutional processes.	Lizote, Lana, and Verdinelli (2012).	Implement semester-based satisfaction surveys; create an internal academic evaluation commission; promote periodic meetings with class representatives; and publicly share improvements implemented based on feedback.	Transform neutral evaluations into active engagement, giving students a voice to foster constant course improvements.
Need to strengthen student monitoring and engagement, leveraging strong institutional pride (66%) and high course recommendation rates (80%).	Reis and Vicente (2023).	Create permanent student leadership programs (course ambassadors, technical clubs); involve students in institutional visibility projects and expand integration activities.	Enhance satisfaction rates with administrative support and ensure technological resources are adequate for technical education.

Source: Authors (2026)

Preserving and enhancing these improvements is essential to ensure the maintenance of high satisfaction levels and to consolidate the formative experience as a benchmark within the context of professional technical education.

Final Considerations

The technical course in Production Planning and Control (PPC) is a strategic training program focused on the management of industrial processes. It integrates production resources with market demand, aiming to qualify students to optimize flows and reduce operational costs. Because it acts as a link between various sectors, the training of this professional requires a careful balance between theory and practice.

In this context, the present study aimed to analyze the satisfaction factors of graduating students in the PPC technical course at a state professional

education school, articulating perceptions regarding teaching quality, pedagogical practices, infrastructure, and the contribution of the training to their professional future.

The results highlighted a promising scenario, with predominantly positive indices of overall satisfaction. However, as cautioned by the literature (Souza; Benites, 2021; Frigotto; Ciavatta; Ramos, 2005), one must be careful when interpreting these indicators as direct evidence of formative quality. Student satisfaction can be influenced by external factors, such as previous expectations, the social value of the profession, and perceived opportunities in the labor market. Thus, the high levels of satisfaction identified should be understood as an important signal, but not as the sole measure of institutional or pedagogical success. At the same time, the study revealed significant challenges, such as the presence of students who entered the course due to external influence or lack of options, perceptions of insufficient infrastructure by a portion of respondents, and neutral or dissatisfied evaluations regarding institutional support.

Given this framework, the study proposed a set of improvements distributed across four pillars, as synthesized in Chart 2: orientation actions for course selection; qualification of methodologies and expansion of practical experiences; enhancement of infrastructure and institutional support; and the strengthening of spaces for student feedback and participation. It is believed that adopting these measures can contribute to consolidating the perceived quality of the PPC technical course, enhancing the school's role in training professionals capable of acting within the strategic core of production, and, ultimately, responding more effectively to the demands of professional and technological education in the current context.

Despite contributing to the understanding of student satisfaction in the analyzed course, this study presents some limitations that must be considered. The data were collected at a single institution within the state network, which restricts the generalization of the results to other educational contexts, school

networks, or delivery modes. Furthermore, the investigation focused on only one course and a specific reality, marked by certain infrastructure conditions, student profiles, and pedagogical organization, which reinforces the contextual nature of the findings.

In light of these limitations, it is recommended that future research include comparisons between different technical courses, institutions, and networks (state, federal, and private) to map similarities and specificities in student satisfaction across distinct contexts. More comprehensive studies that track students throughout the course and after graduation could also deepen the analysis of the training's impact on the academic and professional trajectories of alumni. Additionally, investigations that articulate quantitative and qualitative methods—using interviews, focus groups, or field diaries—could explore more deeply the subjective aspects of the student experience, such as expectations, feelings of belonging, and perceptions of the professional identity constructed within professional and technological education courses.

Finally, it is understood that the results presented here are not exhaustive but rather invite continuous reflection on the quality of technical training in PPC and the school's role in building more consistent professional and human trajectories. By highlighting both strengths and aspects capable of improvement, the study reinforces the need for professional and technological education institutions to maintain a permanent dialogue with their students, using student feedback as a strategic input for planning, pedagogical innovation, and the strengthening of the social commitment of technical education.

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Note

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