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Teaching Intellectual Property in Basic Education: challenges and perspectives

Ensino da Propriedade Intelectual na Educação Básica: desafios e perspectivas

Perla Inácio Amorim[1], Tânia Cristina da Silva Cruz[1], Sônia Marise Salles Carvalho[1], Tiago Magalhães Machado[1]

[1]University of Brasília, Brasília, Federal District, Brazil

Abstract

This study examines the importance of teaching Intellectual Property (IP) in basic education to foster a culture of innovation from early schooling. Aligned with the National Common Curricular Base and the Legal Framework for Innovation, it aims to prepare students for global and technological challenges while promoting protection of their creations. A qualitative and exploratory methodology was adopted, based on literature review and case analysis. Nine key articles, published between 2014 and 2024, were carefully selected from the Capes Journal Portal. Diagrams and tables were developed to organize and interpret the data, emphasizing pedagogical strategies for incorporating IP into school curricula. Findings reveal major gaps in teacher training and a shortage of IP-specific teaching materials. Measures such as educator training, creation of pedagogical resources, and implementation of IP-focused modules were identified as essential to overcoming these challenges and establishing IP education as a fundamental component of basic education for innovation.

Keywords: Intellectual Property. Teaching. Basic Education.

Resumo

Este estudo investiga a importância do ensino da Propriedade Intelectual (PI) na educação básica, com o objetivo de fortalecer uma cultura de inovação desde os primeiros anos escolares, alinhando-se à Base Nacional Comum Curricular e ao Marco Legal de Inovação. A proposta tem como intuito preparar os estudantes para desafios do cenário global e tecnológico, incentivando a proteção de suas criações. A pesquisa adota abordagem qualitativa e exploratória, baseada em revisão de literatura e análise de casos, com seleção criteriosa de nove artigos publicados entre 2014 e 2024, obtidos no Portal de Periódicos da Capes. Diagramas e Boxs complementam a organização e interpretação dos dados. Os resultados mostram que, embora a PI seja reconhecida como estratégica, há falhas na formação de professores e escassez de materiais didáticos. Medidas como capacitação docente, criação de recursos pedagógicos e inserção de módulos sobre PI revelaram-se essenciais para consolidar sua presença no currículo escolar.

Palavras-chave: Propriedade Intelectual; Ensino; Educação Básica.

Technological Areas: Technological Education, Intellectual Property, and Knowledge Management.

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1 Introduction

The mandatory implementation of the National Common Curricular Base (BNCC) across all public and private educational systems in Brazil has catalyzed significant transformations in the country's educational landscape. This normative document, which establishes students' learning and development rights, seeks to ensure high quality and equitable education for all, regardless of geographic location or socioeconomic status (Brazil, 2018a).

Within this context, educational systems have undergone substantial changes, promoting pedagogical practices aligned with the ten general competencies established by the BNCC. These competencies encompass a broad range of skills, from scientific thinking to digital literacy, preparing students to face the challenges of the twenty-first century (Brazil, 2018a).

Among these general competencies, Competency 2 of the BNCC deserves particular attention, as it emphasizes the importance of fostering intellectual curiosity, applying scientific methods to solve problems, and developing innovative solutions (Brazil, 2018a). This emphasis reflects the need to prepare students for real-world contexts in which they can effectively exercise critical and creative thinking skills.

To foster these skills, schools encourage students to participate in scientific and technological events, such as the Brazilian Science and Engineering Fair (FEBRACE) and the FIRST LEGO League Challenge (FLLC) organized by SESI Robotics. During these events, students present projects and solutions that often possess significant innovative potential. However, the detailed public disclosure of such inventions may compromise the novelty requirement and, consequently, prevent them from obtaining intellectual property protection.

Given the strategic importance of innovation for national development, as established by Brazil's New Legal Framework for Science, Technology, and Innovation (Law No. 13,243/2016) and Decree No. 9,283/2018, it is imperative to prepare students to understand and protect their creations. The lack of Intellectual Property (IP) education at this level of schooling constitutes a gap that must be addressed. Therefore, this article examines the importance of and strategies for the systematic integration of Intellectual Property education into Brazilian basic education, in alignment with the BNCC and the Innovation Legal Framework. The objective is to equip students with the knowledge and skills required to compete in a global marketplace while fostering a culture of conscious and responsible innovation.

The relevance of this issue becomes even more evident when considering that science and technology events often culminate in highly visible international competitions, such as those held in Houston, which bring together hundreds of teams from numerous countries. The extensive exposure of student projects in these settings highlights the urgent need to adequately educate both students and their mentors about the importance of Intellectual Property. Studies such as those conducted by Barbalho and Antunes (2019) and Coelho, Pereira, and Silva (2023) have already emphasized the need to develop Intellectual Property competencies from the earliest stages of education, thereby preparing young people to navigate the challenges and opportunities of an increasingly innovation-driven world.

The concept of innovation, as defined by Law No. 13,243/2016, which establishes incentives for scientific development, research, scientific and technological capacity building, and innovation, is

> [...] the introduction of a novelty or improvement into the productive or social environment that results in new products, services, or processes, or that involves the addition of new functionalities or characteristics to an existing product, service, or process, which may lead to improvements and effective gains in quality or performance" (Brazil, 2016, Art. 2, Item IV).

In the field of public policy, the New Legal Framework for Innovation, established by Law No. 13,243/2016, serves as an important normative foundation. This legal framework aims to facilitate technology transfer and promote a research environment that is more closely integrated with the productive sector (Brazil, 2016). As highlighted by Velho, Campagnolo, and Dubeux (2020), the effective implementation of this framework can directly contribute to the integration of Intellectual Property education into basic education.

Technology transfer, identified as one of the objectives of the Legal Framework, involves the sharing of scientific and technological knowledge among different sectors. Costa, Pilatti, and Santos (2021) discuss how alignment between academic innovation and market demands can create opportunities for the development of new ideas. Within the context of basic education, the inclusion of Intellectual Property in the curriculum can prepare students to recognize opportunities arising from innovation and understand how to transform them into practical solutions. Such preparation is strategically important for fostering a more informed and innovative generation.

Silva and Profeta (2022) examine the relevance of integrating Intellectual Property into technical education and emphasize that such initiatives can be adapted to basic education, promoting both creativity and an understanding of the legal implications associated with intellectual creations. This adaptation would enable students to

recognize the value of their ideas and understand how to protect their innovations.

Furthermore, Schumpeter (1997) introduced the concept of "creative destruction," which describes how innovative ideas replace existing practices, generating social and economic progress. By incorporating Intellectual Property concepts into the curriculum, students learn to navigate this cycle of innovation and contribute to sustainable development.

Rogers (1983), in turn, argues that novelty is a fundamental characteristic of innovations, as it stimulates interest and reduces uncertainty. In the context of Intellectual Property education, this theory can be applied through dynamic teaching approaches, such as workshops and educational games, that connect theoretical concepts to students' everyday experiences. These methodologies not only enhance student engagement but also facilitate the learning of complex concepts.

Meaningful learning, as advocated by Ausubel (1963), reinforces the importance of connecting new knowledge to students' prior knowledge in order to promote meaningful learning. Applying these principles to Intellectual Property education enables students to understand not only the value of their creations but also the ethical and legal implications associated with intellectual property protection. This connection makes learning more relevant and better aligned with contemporary societal and economic demands.

The integration of Intellectual Property concepts into basic education can establish a theoretical and practical foundation that strengthens this dynamic, contributing to sustainable development and economic growth.

Within this context, this article presents an innovative approach to integrating Intellectual Property into basic education by proposing practical and pedagogical strategies that include teacher training, the development of tailored educational materials, and the implementation of interactive teaching methodologies. These proposals seek to foster a culture of innovation and appreciation for student-created work, connecting school learning to the demands of the global marketplace while promoting responsible entrepreneurship.

In light of these considerations, the primary objective of this article is to investigate how Intellectual Property can be integrated into basic education in order to foster innovation and protect student-created works. Within the educational context, the integration of Intellectual Property (IP) not only supports the development of students' technical and creative skills but also prepares them for a constantly evolving marketplace in which knowledge and innovation constitute essential assets.

The educational approach proposed in this study seeks to highlight practical and pedagogical strategies that strengthen the incorporation of Intellectual Property into basic education, thereby fostering a culture that recognizes and values students' intellectual creations. This research aims to contribute directly to the discussion of how Intellectual Property concepts can be taught and applied, offering proposals to address and overcome existing educational challenges.

2 Methodology

This study adopted an exploratory and qualitative approach to investigate the teaching of Intellectual Property (IP) in basic education, with the aim of identifying potential challenges and prospects for its implementation. According to Gil (2019), exploratory research provides greater familiarity with a problem, making it more explicit and facilitating the development of hypotheses. Qualitative methodology, in turn, enables a deeper analysis and interpretation of the complexity of human behavior, offering detailed insights into perceptions, habits, attitudes, and behavioral trends (Marconi & Lakatos, 2017).

The relevance of employing both exploratory and qualitative research methods is directly linked to the purpose of this study, which seeks not only to identify barriers but also to propose practical solutions for overcoming challenges related to Intellectual Property education. This approach allows for a holistic understanding of the issue by incorporating both theoretical and practical perspectives to support the proposed recommendations.

The study began with a literature search conducted through the CAPES Journal Portal using the search terms "Intellectual Property" AND "Education," with the objective of identifying research published on Intellectual Property education between 2014 and 2024. This initial search was carried out between May 19 and May 21, 2024, and yielded 90 articles. To refine the search specifically for basic education, the term "basic education" was subsequently added. The results included 21 articles that were not directly related to basic education and nine articles that contributed to the theoretical foundation of this study. In addition, one relevant article from the initial search was retained, addressing the teaching of Intellectual Property in technical education programs offered by Firjan/SENAI.

The combination of search filters ensured that the selected articles were directly relevant to the research topic, enabling a rigorous selection process that contributed to the depth and quality of the analyses conducted. This methodological rigor ensures that the conclusions presented in this study are grounded in reliable and consistent evidence.

The selection, inclusion, and exclusion of articles followed a flowchart adapted from Marconi and Lakatos

(2017), detailing each stage from the initial search to the final inclusion of articles considered relevant for analysis. Inclusion and exclusion criteria were rigorously applied to ensure the relevance and quality of the studies reviewed. Duplicate records were removed, and a screening process based on titles and abstracts was conducted to verify the alignment of the studies with the established criteria.

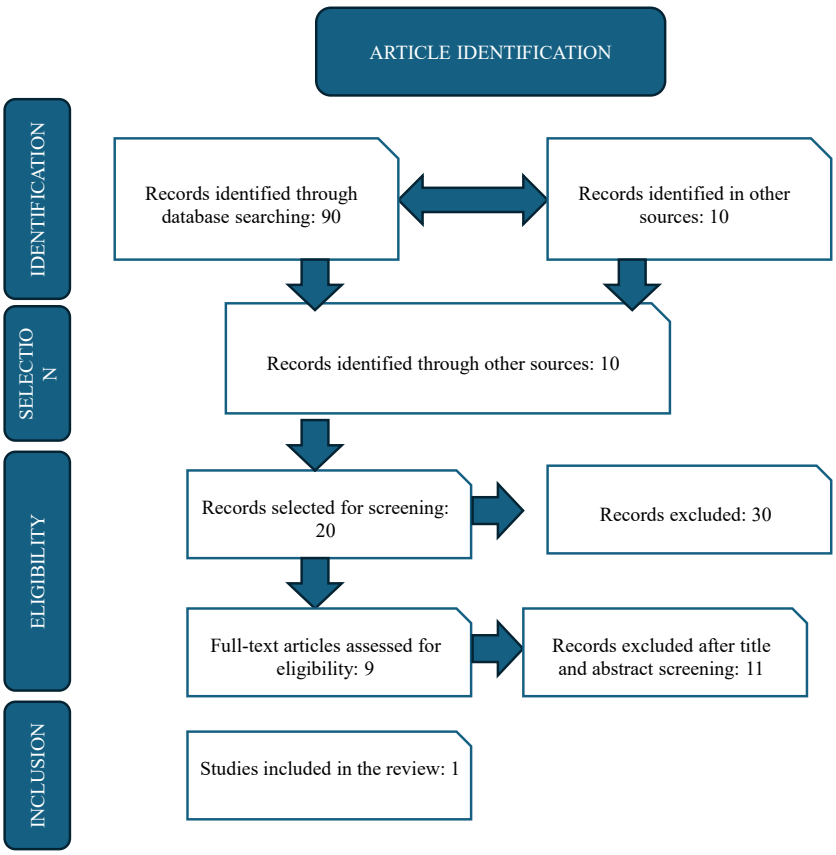
The detailed screening of the articles made it possible to identify specific gaps in the literature, particularly the lack of studies directly linking Intellectual Property education to basic education. This finding reinforces the need for a more in-depth examination of this topic.

The selected articles were subsequently assessed in full text, enabling a comprehensive evaluation of their scientific contribution and practical relevance to the subject under investigation. Figure 1 illustrates the article selection and exclusion process, presenting the flowchart of the methodology adopted in this study.

The systematic analysis of the selected articles was conducted based on qualitative criteria, considering both their thematic relevance and the practical applicability of their findings to the context of basic education in Brazil. Each article was reviewed in detail, with particular attention given to the methodologies employed and the proposals presented, enabling a critical synthesis that informs the conclusions of this study. This process sought to identify recurring elements in pedagogical practices and theoretical approaches related to Intellectual Property education, as well as gaps that still require further investigation.

In addition, analytical categories were established to encompass key aspects such as teacher training, the development of educational materials, interactive pedagogical practices, and alignment with public policies. These categories enabled a more structured evaluation of the contributions of each study, highlighting their connections to the educational framework established by the BNCC and the objectives of the present research. The categorization process also facilitated the identification of patterns and trends, making it possible to develop pedagogical strategies aligned with the demands of the global marketplace and the need to foster innovation in basic education.

Figure 1 – Flowchart of the Methodological Process for Article Selection, Inclusion, and Exclusion



Source: Adapted from Marconi and Lakatos (2017)

To ensure the integrity and validity of the analysis, a data triangulation process was adopted, cross-referencing information extracted from the selected articles with the guidelines established by the BNCC and the Innovation Legal Framework. This multidimensional approach not only enabled the validation of the findings but also provided a deeper understanding of how Intellectual Property can be effectively integrated into the school curriculum, addressing the specific needs of both students and teachers.

The methodology described herein ensures that the study is grounded in academic literature, contributing to a broader understanding of the challenges and opportunities associated with Intellectual Property education in basic education. The inclusion of Table 1, presenting the studies analyzed, serves to justify the selection of the articles and clarify the theoretical foundation underpinning the analysis of the results and the subsequent discussion.

3 Results and Discussion

The investigation into the implementation of Intellectual Property (IP) education in basic education revealed significant gaps, both in teachers' knowledge and in the available pedagogical infrastructure, as discussed in the introduction. Silva and Profeta (2022) highlighted that the lack of basic knowledge of Intellectual Property limits students' ability to protect their creations. This gap directly undermines the connection between the development of innovations and their successful application in the marketplace.

Rodrigues, Santos, and Oliveira (2023) emphasized the scarcity of initiatives aimed at Intellectual Property education within Federal Institutes and pointed out that the lack of structured teacher training constitutes one of the primary obstacles to the effective implementation of this subject area. This conclusion is consistent with the findings of Przybylovicz and Cordeiro Machado (2022), who identified significant deficiencies in teacher preparation regarding Intellectual Property and copyright-related issues.

To address these challenges, the findings of the present study suggest a strategic plan for teacher training, as presented in Box 2. This plan includes both practical and theoretical activities designed to equip teachers with the knowledge and competencies required to effectively integrate Intellectual Property into basic education.

The findings also revealed that the integration of Intellectual Property (IP) into basic education can be facilitated through practical and engaging learning activities. Coelho, Pereira, and Silva (2023) proposed the use of educational games and workshops as interactive approaches for introducing Intellectual Property concepts to students. These strategies help contextualize the importance of protecting innovations within the global marketplace.

Furthermore, as emphasized by Barbalho and Antunes (2019), the development of Intellectual Property competencies should begin at the earliest levels of education. The authors suggest that incorporating Intellectual Property into subjects such as science and technology can connect these concepts to students' practical learning experiences. To illustrate these proposals, Box 3 was developed, presenting examples of practical activities designed to support the teaching of Intellectual Property in basic education.

Another essential aspect identified in the literature concerns the role of public policies in promoting Intellectual Property (IP) education. Velho, Campagnolo, and Dubeux (2020) argue that the Innovation Legal Framework is fundamental for creating a regulatory environment that strengthens educational initiatives related to Intellectual Property. As discussed in the introduction, these policies can be adapted to meet the specific needs of basic education by fostering partnerships among schools, universities, and the productive sector.

Fujita, Mata, and Sousa (2023) further highlighted that Intellectual Property management practices adopted by public higher education institutions can serve as a model for basic education schools. These examples demonstrate how the development of local policies can promote both innovation and intellectual property protection among students.

The National Common Curricular Base (BNCC) has introduced significant advances by establishing guidelines that promote equity in Brazilian education. However, although its general competencies provide a clear framework for the comprehensive development of students, persistent challenges remain in the operationalization of these guidelines, particularly in relation to Intellectual Property. The absence of specific guidance on how to incorporate Intellectual Property into the curriculum highlights a gap that must be addressed in order to align education with the demands of the contemporary global marketplace.

The BNCC can play a fundamental role in integrating Intellectual Property into school curricula. As discussed throughout this study, by establishing both general and specific competencies, the BNCC can serve as a catalyst for coordinated efforts aimed at incorporating Intellectual Property education across all levels of basic education. Box 4 illustrates how the competencies established by the BNCC can be aligned with Intellectual Property pedagogical practices.

Intellectual Property emerges as a strategic tool not only for protecting innovations but also for fostering critical and creative thinking. In emphasizing the importance of Competency 2 of the BNCC, it is essential to broaden the understanding of how scientific methods and the

Box 1 – Articles Identified in the CAPES Journal Portal (2014–2024) on Intellectual Property Education

Authors	Year	Title	Study Focus	Summary
Rodrigues, D. S.; Santos, R. M. N.; Oliveira, R. C.	2023	Intellectual Property as a Component of the Educational Development of Students Enrolled in Technical Programs at Federal Institutes in Northern Brazil	Intellectual Property in Technical Education	Highlights the need to teach Intellectual Property, innovation, and entrepreneurship in the Federal Institutes of Northern Brazil.
Fujita, A. T., da Mata, J. F., & Sousa, L. C.	2023	The Management of Intellectual Property in Public Higher Education Institutions in the State of Minas Gerais	Intellectual Property in Public Institutions	Examines patent granting practices in public higher education institutions in the state of Minas Gerais, focusing on patent applications filed through Technology Innovation Centers (NITs).
Silva, J. C.; Profeta, G. A.	2022	The Importance of Intellectual Property Education in Technical Programs: The Case of FIRJAN SENAI	Intellectual Property Education in Technical Programs	Evaluates the level of awareness of Intellectual Property among students enrolled in technical education programs and advocates for the inclusion of Intellectual Property in the curriculum.
Santos, C. do C. dos	2022	Intellectual Property, Technology Transfer, and Basic Education	Intellectual Property and Basic Education	Discusses the importance of Intellectual Property and technology transfer in basic education, proposing their integration into the school curriculum.
Przybylovicz, L.; Freire Rocha Cordeiro Machado, M.	2022	Copyright and Intellectual Property: Teachers' Knowledge and Lack of Knowledge	Teachers' Knowledge of Intellectual Property	Analyzes teachers' knowledge of copyright and Intellectual Property, revealing significant gaps in understanding.
Coelho, M. M. R.; Pereira, D. R.; Silva, F. P. E. da	2023	An Investigation into the Dissemination of Intellectual Property (IP) Education for Children and Adolescents	Intellectual Property for Children and Adolescents	Explores methods for teaching Intellectual Property to children and adolescents, aiming to enhance awareness and understanding of Intellectual Property concepts.
Freire, V. M. V.; Carvalho, J. M. de	2021	Intellectual Property for Innovation: Perceptions and Perspectives in a Vocational School	Intellectual Property in Vocational Education	Discusses perceptions and perspectives regarding Intellectual Property in a vocational school setting, with an emphasis on innovation and the practical application of knowledge.
Velho, S. R. K.; Campagnolo, J. M.; Dubeux, R. R.	2020	The Regulatory Framework of Brazil's New Innovation Legal Framework	Innovation Legal Framework	Examines the impact of Brazil's New Innovation Legal Framework on technological development and research activities.
Barbalho, C. R. S.; Antunes, A. M. S.	2019	Competency Development for Intellectual Property	Intellectual Property Education	Investigates the development of competencies related to Intellectual Property and highlights the importance of Intellectual Property education across all levels of education

Source: Prepared by the authors (2024)

Box 2 – Teacher Training Plan in Intellectual Property

Phase	Activities	Objectives
Introduction to Intellectual Property	Introductory workshops on Intellectual Property	Familiarize teachers with the fundamental concepts of Intellectual Property
Case Studies	Analysis of real-world Intellectual Property cases	Demonstrate the practical application of Intellectual Property
Development of Educational Materials	Development of tailored educational resources	Equip teachers with effective instructional tools and resources
Assessment and Feedback	Ongoing assessment and feedback sessions	Continuously improve pedagogical practices

Source: Prepared by the authors (2024)

Box 3 – Examples of Activities for Teaching Intellectual Property

Activity	Description	Benefits
Educational Games on Intellectual Property	Simulation of patent application processes	Teaches Intellectual Property concepts through interactive learning
Creative Workshops	Development of prototypes and innovative solutions	Promotes creativity and practical application of knowledge
Science Fairs	Presentation of research projects	Encourages teamwork and critical thinking skills
Innovation Workshops	Hands-on sessions focused on creativity and innovation	Stimulates the generation of new ideas and prototype development

Source: Prepared by the authors (2025)

Box 4 – Alignment of BNCC Competencies with Intellectual Property Education

BNCC Competency	Intellectual Property Pedagogical Practices	Expected Outcomes
Scientific Thinking	Intellectual Property-Based Investigations	Develops critical thinking and innovation skills
Digital Culture	Use of Interactive Digital Platforms	Enhances engagement and practical understanding of Intellectual Property concepts
Argumentation	Discussions on Copyright and Intellectual Property Rights	Strengthens the ability to defend ideas and intellectual creations
Communication	Presentations of Innovative Projects	Improves oral and written communication skills

Source: Prepared by the authors (2024)

development of innovative solutions can be applied within basic education. Such application extends beyond technical skills, incorporating ethical and social dimensions that strengthen both citizenship education and entrepreneurial development.

Furthermore, Intellectual Property serves as an important mechanism for promoting innovation and entrepreneurship, functioning as a strategic driver of a nation's technological and economic development. According to Dornelas (2014), we are living in an Entrepreneurial Era, in which the capacity to innovate has become a fundamental competitive advantage. Within this context, Intellectual Property provides creators and inventors with the legal protection necessary to invest in original ideas, transforming knowledge into value-added products and services.

The connection between Intellectual Property (IP), technological innovation, and entrepreneurship has become

increasingly evident, particularly with the growth of startups and the digital ecosystem. However, this triad should not be confined to higher education or the corporate sector. For an innovation-driven culture to become firmly established, fundamental concepts of Intellectual Property must be introduced from the earliest stages of education, fostering an educational environment that values creativity, critical thinking, and respect for the intellectual creations of others.

By incorporating this content into schools, a generation can be developed that is more aware of its rights and responsibilities as both creators and consumers of knowledge. Moreover, such an approach lays the groundwork for young entrepreneurs to operate with greater autonomy and confidence in rapidly changing environments. Therefore, Intellectual Property should be viewed not merely as a legal instrument but as a strategic component of educational development.

For students, fostering innovation requires a pedagogical approach that emphasizes interactive learning practices. The presentation of student-created projects at events such as the Brazilian Science and Engineering Fair (FEBRACE) and the FIRST LEGO League Challenge (FLLC) organized by SESI Robotics should be accompanied by a solid foundation in Intellectual Property, ensuring that participating students understand their rights concerning their inventions. Such awareness is essential for strengthening student agency and encouraging the generation of original ideas.

Although the Innovation Legal Framework has been extensively discussed within technical and scientific contexts, its application to basic education remains limited. Incorporating the objectives of this framework into basic education could promote a more inclusive culture of innovation, enabling students to understand technology transfer processes and intellectual property protection. Such adaptation requires a clearer articulation between public policies and pedagogical practices.

The absence of Intellectual Property education in the basic education curriculum reflects a disconnect between societal demands and formal schooling. Technology transfer, one of the central objectives of the Innovation Legal Framework, can be introduced into the school environment through practical and interactive activities that connect scientific concepts to students' everyday experiences. In this way, it is possible to create learning environments that encourage the practical application of knowledge and strengthen student agency.

The inclusion of Intellectual Property in the school curriculum is strategically important for preparing students to address contemporary challenges related to technological innovation and intellectual property protection. Przybylovicz and Cordeiro Machado (2022) emphasized that, without adequate teacher training, students may face difficulties in understanding key concepts related to copyright and Intellectual Property. Continuous professional development programs and the creation of specialized educational materials were identified as essential measures for overcoming this barrier.

Complementing this perspective, Coelho, Pereira, and Silva (2023) explored the effectiveness of interactive methodologies, such as creative workshops, in promoting meaningful learning. These activities encourage students to apply Intellectual Property concepts in practical contexts, helping them develop both technical and creative skills. In addition, science and technology fairs, as suggested by Rodrigues, Santos, and Oliveira (2023), can serve as valuable tools for engaging students and demonstrating the relevance of Intellectual Property in the development of innovative solutions.

Fujita, Mata, and Sousa (2023) emphasized the role of public institutions in fostering innovation through Intellectual Property management policies. Adapting successful practices from these institutions to the context of basic education could facilitate the creation of innovation-friendly environments from an early age, promoting an entrepreneurial mindset among students.

Public policies also play an essential role in advancing Intellectual Property education. Velho, Campagnolo, and Dubeux (2020) identified the Innovation Legal Framework as a robust regulatory foundation for encouraging the integration of Intellectual Property into school curricula. Coordination among schools, universities, and specialized companies can create an ecosystem that values innovation and expands the reach of Intellectual Property education.

Carvalho and Freire (2021) proposed incorporating Intellectual Property modules into existing subjects such as science and technology, arguing that this adaptation can facilitate connections between school education and the demands of the global marketplace. This proposal reflects the need for an interdisciplinary approach aligned with the principles established by the BNCC.

Furthermore, Barbalho and Antunes (2019) emphasized the importance of addressing ethics and intellectual property protection from the earliest levels of schooling. Intellectual Property education contributes directly to the development of innovative citizens who are aware of their rights and responsibilities and are prepared to face the challenges of the twenty-first century.

To illustrate the challenges and opportunities identified in this analysis, Box 5 was developed to present practical strategies for the implementation of Intellectual Property education.

The articulation between pedagogical practices and public policies is indispensable for consolidating Intellectual Property (IP) education. Carvalho and Freire (2021) emphasized that the inclusion of Intellectual Property modules

within existing subjects, such as science and technology, can facilitate both the learning and practical application of these concepts. Likewise, the implementation of interactive workshops described by Coelho, Pereira, and Silva (2023) provides students with opportunities to experiment, create, and innovate within a supportive environment where their intellectual contributions are recognized and valued.

To further support this analysis, Box 6 was developed to present the main challenges and solutions identified in the studies reviewed. It highlights the key obstacles to the implementation of Intellectual Property education, as well as the solutions proposed to address them effectively.

These findings reinforce that the integration of Intellectual Property (IP) into the school curriculum requires an interdisciplinary approach aligned with the general competencies established by the BNCC and the demands of contemporary society. Investing in teacher training and the development of educational materials are essential steps toward overcoming the challenges identified, while interactive and collaborative practices can make Intellectual Property education more engaging and effective.

The evidence analyzed in this study indicates that Intellectual Property education has the potential to transform the school environment by fostering a culture of intellectual property protection, innovation, and entrepreneurship. The articulation among public policies, pedagogical practices, and interinstitutional collaboration is fundamental to achieving this transformation. Investing in Intellectual Property education ultimately means investing in the future of the country by promoting a society that is more equitable, democratic, innovative, and technologically advanced.

4 Final Considerations

The investigation conducted in this study highlighted the importance of incorporating Intellectual Property (IP) education into the basic education curriculum as an essential tool for the development of a society driven by innovation and knowledge. The analysis revealed that, despite the growing recognition of the relevance of Intellectual Property, significant challenges remain, including insufficient teacher training, the lack of specialized educational materials, and the absence of a structured curricular approach. These challenges hinder the broad and effective implementation of Intellectual Property education in schools, reinforcing the need for more systematic and integrated strategies.

The findings indicated that students with a solid understanding of Intellectual Property are better equipped to protect their creations and apply them in real-world

Box 5 – Strategies for Integrating Intellectual Property into Basic Education

Strategy	Description	Expected Impact
Teacher Training	Continuous training in Intellectual Property and copyright	Enhancement of educators' knowledge and competencies
Adapted Educational Materials	Development of age-appropriate educational content	Making Intellectual Property accessible and engaging for students
Interinstitutional Partnerships	Collaboration with universities and subject-matter experts	Access to technical resources and practical learning experiences
Interactive Workshops	Implementation of hands-on Intellectual Property workshops	Practical application of innovation and intellectual property protection concepts

Source: Prepared by the authors (2024)

Box 6 – Challenges and Proposed Strategies for Intellectual Property Education in Basic Education

Identified Challenges	Proposed Solutions
Inadequate Teacher Training	Continuous Professional Development Programs in Intellectual Property
Lack of Specialized Educational Materials	Development of Age-Appropriate Educational Content
Limited Curriculum Integration	Integration of Intellectual Property into Existing Subjects, Such as Science
Low Student Engagement	Use of Interactive Methodologies, Including Educational Games and Competitions

Source: Prepared by the authors (2025)

innovation contexts. Strategies such as teacher training, the development of specialized educational resources, and the incorporation of Intellectual Property content into existing subjects were identified as fundamental to achieving this objective. These measures have the potential to enhance educational quality by strengthening the connection between theoretical learning and practical application while fostering a culture of innovation.

In addition, this study presented a series of Boxes summarizing the principal challenges and proposed solutions, thereby providing a practical framework to guide future initiatives. For example, Box 6 highlights gaps in teacher preparation and emphasizes the role of interactive methodologies as effective approaches for increasing student engagement and promoting dynamic, meaningful learning experiences.

Within this context, the integration of Intellectual Property education into the basic education curriculum should be regarded as an urgent priority. The inclusion of Intellectual Property concepts from the earliest years of schooling is essential for developing citizens capable of acting critically and innovatively in a society increasingly shaped by technology and entrepreneurship.

The analysis also identified inconsistencies in the existing literature, including a lack of uniformity in educational approaches and the absence of explicit guidelines within the National Common Curricular Base (BNCC). These inconsistencies underscore the urgency of implementing broader and more coordinated public policies capable of standardizing and strengthening Intellectual Property education throughout the country.

The implementation of Intellectual Property education also has the potential to transform schools into agents of innovation within their communities. By equipping teachers with the necessary competencies and incorporating interactive methodologies, schools can become centers of creativity that encourage the development of practical solutions to local challenges. This impact extends beyond the school environment, generating a multiplier effect throughout society by strengthening a culture of intellectual property protection and collaboration among different sectors.

Furthermore, the analysis emphasized the importance of adapting Intellectual Property education to the realities of Brazil's diverse regions. The country's socioeconomic and cultural diversity requires flexible and accessible strategies that take local contexts into account in order to ensure equity in the implementation of educational guidelines. The adoption of technological tools and customizable educational materials may be decisive in facilitating the inclusion of Intellectual Property education in schools facing infrastructure limitations.

Finally, the integration of Intellectual Property education should be accompanied by continuous monitoring and evaluation systems. Indicators such as student engagement, the quality of projects developed, and the practical application of acquired knowledge can provide valuable data for improving implementation strategies. Such monitoring can also strengthen the connection between public policies and educational practices, ensuring that educational and societal objectives are achieved in a sustainable manner.

5 Future Perspectives

The research conducted provided valuable insights into the current state of Intellectual Property (IP) education in basic education, highlighting both the potential and the challenges associated with integrating this essential topic into the curriculum. Future perspectives point toward a promising pathway for overcoming existing barriers and enhancing Intellectual Property education.

One of the primary recommendations is the development of continuous professional development programs for teachers that incorporate practical activities such as workshops, case studies, and analyses of copyright-related issues. Equally important is the creation of educational materials tailored to different age groups and learning needs, enabling a more accessible and engaging educational approach.

The implementation of action research projects has been suggested as a means of testing and adapting educational solutions within real-world learning environments. Such projects can encourage collaboration between teachers and students, generate practical knowledge, and promote student agency throughout the teaching and learning process.

Strategic partnerships with Intellectual Property organizations, companies, and non-governmental organizations are essential for enriching educational experiences through practical applications and real-world case studies. In addition, initiatives such as science and technology fairs should continue to serve as platforms for engaging students and demonstrating the practical relevance of Intellectual Property in the development of innovative solutions.

Looking ahead, the use of emerging technologies, including augmented reality, virtual reality, and educational games, has the potential to transform Intellectual Property education into a more immersive and engaging experience. These technologies can be integrated into digital learning platforms to make Intellectual Property education more accessible, particularly in regions with limited educational infrastructure.

Furthermore, the intersection of Intellectual Property with fields such as ethics, law, and innovation can foster a richer and more comprehensive interdisciplinary approach. Collaboration among these areas of knowledge reinforces the importance of connecting Intellectual Property concepts to practical and societal contexts.

The establishment of learning networks among schools can facilitate the sharing of resources, methodologies, and best practices, promoting an active and collaborative educational community. This approach not only enhances the quality of education but also fosters a culture of innovation and intellectual property awareness that benefits society as a whole.

Finally, influencing educational policies that recognize Intellectual Property as an essential component of the curriculum represents a strategic step toward consolidating its implementation. The inclusion of Intellectual Property in national curricula will not only prepare students for the challenges of the modern workforce but will also contribute to the advancement of a more equitable society driven by knowledge, innovation, and technological progress.

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About the Authors

Perla Inácio Amorim

E-mail: perla.amorim75@gmail.com
ORCID: https://orcid.org/0000-0002-2698-4429
Master's Candidate in Intellectual Property and Technology Transfer for Innovation, University of Brasília, 2024.
Professional Address: SBN, Quadra 1, Bloco I, Armando Monteiro Neto Building, 11th Floor, Asa Norte, Brasília, Federal District, Brazil. ZIP Code: 70040-010.

Tânia Cristina da Silva Cruz

E-mail: taniacristina75@gmail.com
ORCID: https://orcid.org/0000-0002-5673-6784
Ph.D. in Sociology, University of Brasília, 2006.
Professional Address: University of Brasília, Planaltina Campus, Área Especial, Nossa Senhora de Fátima, Planaltina, Brasília, Federal District, Brazil. ZIP Code: 72000-000.

Sônia Marise Salles Carvalho

E-mail: smarises1960@gmail.com
ORCID: https://orcid.org/0000-0003-3069-1298
Ph.D. in Sociology, University of Brasília, 2008. Postdoctoral/Advanced Studies Fellowship (Chair Program) at the Federal University of Itajubá, 2022.
Professional Address: University of Brasília, Center for Technological Development Support (CDT), Darcy Ribeiro University Campus (Gleba A), Brasília, Federal District, Brazil. ZIP Code: 70910-000.

Tiago Magalhães Machado

E-mail: advogadotiago@gmail.com
ORCID: https://orcid.org/0009-0002-0169-2486
Master's Degree in Intellectual Property and Technology Transfer for Innovation, University of Brasília, 2025.
Professional Address: Internal Audit Department, Banco do Brasil, Quadra 5, Lote B, SAUN, s/n, Banco do Brasil Building, Asa Norte, Brasília, Federal District, Brazil. ZIP Code: 70040-912.