



INTERDISCIPLINARITY IN THE SCHOOL CURRICULUM: CHALLENGES AND POSSIBILITIES



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ABSTRACT

Interdisciplinarity in the school curriculum emerges as an essential innovative approach to contemporary education, in response to the demands of a complex and interconnected world. This choice is justified by the need for training that integrates different knowledge, promoting holistic and meaningful learning. The main objective of this study is to investigate how the implementation of interdisciplinarity can transform educational practices and facilitate the construction of contextualized knowledge. The methodology adopted combines a bibliographic and quantitative approach, allowing an in-depth analysis of experiences in educational institutions that have implemented this approach. The main results found indicate that the application of interdisciplinarity contributes to the development of skills such as curiosity, investigation and problem solving, in addition to fostering the connection between disciplines. However, the research reveals that there are significant resistances related to traditional teaching methods and regulatory curricular impositions, which hinder the effective implementation of interdisciplinarity. The conclusions point out that overcoming these challenges implies changes in pedagogical practices and the need for a collective commitment between educators, administrators, students and communities. The search for a curriculum that values the interconnections of knowledge can lead to a more comprehensive, critical and responsible education, preparing students for the various challenges of today's societies. Thus, reflection on interdisciplinarity emerges as a fundamental step in the evolution of education.

Keywords: Interdisciplinarity. School Curriculum. Contemporary Education.

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INTRODUCTION

Interdisciplinarity in the school curriculum emerges as a necessary response to the complexities of the contemporary world, in which the interconnection between different fields of knowledge becomes increasingly evident. This context requires education to reflect on its pedagogical practices, especially as social, technological, and environmental issues intertwine, demanding an approach that goes beyond fragmented teaching traditions. In this sense, the relevance of the theme is configured in a scenario where the integral formation of the student is a primary objective, enabling him to develop critical and reflective skills in the face of multifaceted realities.

When delving deeper into the discussion about interdisciplinarity, nuances emerge that reveal the recent developments related to its implementation in school curricula. The growing appreciation of holistic education reflects a global movement that seeks to equip students with the tools necessary for understanding and solving contemporary problems. However, this approach also faces resistance and challenges, ranging from educational institutions to teaching practices, demonstrating the tension between pedagogical tradition and the need for innovation.

The importance of studying interdisciplinarity in the school curriculum is evidenced in the need to train citizens capable of articulating diverse knowledge to face the challenges of the twenty-first century. Research on this topic contributes significantly to the field of education by proposing a model that favors more meaningful learning and connected with the reality of students. At the same time, it investigates how the integration of knowledge can positively impact the teaching-learning process and promote an education that values the complexity of the world.

The central problem that this research seeks to answer refers to the effectiveness of interdisciplinarity in the formation of critical and creative students. Questions such as: What are the obstacles to the implementation of interdisciplinary practices? How to overcome institutional and methodological barriers? are fundamental to understanding the multiple facets of this debate. The complexity of the topic is intensified by the need to articulate not only academic content, but also socio-emotional skills and competencies that are essential for living in society.

The general objective of the research is to analyze the effects of interdisciplinarity in the school curriculum and how this approach can contribute to the formation of more integrated students prepared for contemporary challenges. By seeking a broad understanding of interdisciplinary practices, it is intended to unveil their impacts on the integral formation of the student.

To achieve this goal, the research will be guided by specific objectives that include: (1) identifying the key challenges faced by educators in implementing interdisciplinary methodologies; (2) to evaluate successful experiences of curricular integration in different contexts; and (3) to propose recommendations for the Continuing Education of teachers focused on interdisciplinary practice. These objectives will serve to map the current scenario and contribute to the advancement of discussions on the matter.

The methodology adopted will be a Bibliographic Methodology, which will allow a critical and in-depth analysis of the existing literature on the subject. Theoretical framework and case studies will be used to exemplify interdisciplinary practices at different educational levels, seeking to understand how these experiences can be effectively applied in the school context. The research also focuses on mapping the contributions and results promoted by these approaches, creating a solid basis for future investigations.

In summary, interdisciplinarity in the school curriculum presents itself as a necessary and enriching approach, which must be understood in its multiple dimensions and challenges. The discussion about its implementation reveals the urgency of rethinking teaching methodologies, providing a broader and more integrated learning space. Thus, the transition to the body of the work will take place in the search for answers that support this new way of teaching, promoting a critical dialogue between theory and educational practice.

THEORETICAL FRAMEWORK

Interdisciplinarity, as an educational principle, emerges as a central theme of discussion in the field of education. This approach seeks to integrate different knowledge and knowledge, recognizing that the disciplines are not isolated, but interconnected in a complex network of interactions. The understanding of interdisciplinarity proposes an innovative look at the learning process, promoting a more comprehensive and contextualized education, essential in a world that faces multifaceted challenges. From this perspective, the discussion about the relevance of interdisciplinarity becomes fundamental for the development of pedagogical practices that seek not only the transmission of content, but the construction of a more holistic education.

In the theoretical sphere, the contributions of authors such as Klein and Repko stand out, which reinforce the idea that knowledge should be seen in an integrated way. Interdisciplinarity is not restricted to the sum of contents, but involves the creation of new knowledge from the combination of different areas of knowledge. This synergy is seen as a necessary condition for the formation of a critical student capable of interpreting the complexity of reality. When addressing the disciplinary intersection, these authors

emphasize not only the interdependence of the areas of study, but also the need for pedagogical practices that encourage the articulation between them.

The historical evolution of ideas related to interdisciplinarity reveals a path that coincides with the emergence of new social and educational demands. From the critical pedagogy, defended by Paulo Freire, which prioritizes a dialogical and reflective education, to the contemporary proposals that incorporate Howard Gardner's theory of multiple intelligences, there is a growing appreciation of practices that transcend the traditional limits of the disciplines. This trajectory demonstrates how interdisciplinarity has become a response to the challenges of today's education, fostering a learning environment that values diversity and inclusion.

Currently, the debate around interdisciplinarity encompasses different perspectives and approaches, reflecting the particularities of different educational contexts. Pedagogical practices that incorporate this approach face challenges related to teacher training, curriculum structure, and resistance from institutions that still operate under traditional paradigms. However, there is also a growing movement in favor of the adoption of interdisciplinary strategies, considering that the complexity of contemporary problems requires solutions that require varied and complementary knowledge.

In this context, it is essential to relate the theoretical concepts to the research problem in question. Interdisciplinarity is not just a methodology, but rather an educational philosophy that seeks to transcend the limitations of fragmented knowledge. Education research investigating the impact of interdisciplinarity should consider how this approach has the potential to transform pedagogical practice and, consequently, the learning process of students. In this sense, teacher training, working conditions and the articulation between theory and practice are essential aspects to be considered.

Finally, the consolidation of a robust theoretical framework around interdisciplinarity is essential to support the proposed study. It is through the critical analysis and synthesis of the contributions of various authors that it becomes possible to understand the magnitude of this approach in the educational context. By recognizing that interdisciplinarity promotes a more integrative and adaptable education, it is possible to envision new paths for the formation of critical and conscious citizens, able to face the challenges of the twenty-first century. This reinforces the idea that interdisciplinarity not only enriches the curriculum, but also transforms the educational experience into a more meaningful and engaging practice for all involved.

THE IMPORTANCE OF INTERDISCIPLINARITY IN THE SCHOOL CURRICULUM

Interdisciplinarity in the school curriculum emerges as an essential approach for the formation of knowledge that goes beyond the traditional boundaries between disciplines. This educational setting reflects the complexity of today's world and aims to develop critical skills in students, preparing them for the academic and professional challenges they will face. The proposal to integrate diverse knowledge not only enriches learning, but also enables students to perceive the interrelationships between contents, allowing a broader understanding of reality.

One of the benefits of this practice is the ability for students to connect knowledge from different areas, promoting a contextualized view of the topics covered. As they engage in projects that require the simultaneous application of knowledge from mathematics, science, arts, and humanities, students are encouraged to adopt a critical and reflective stance. This ability to articulate ideas in an integrated way is increasingly valued in the job market, where innovative solutions demand comprehensive and multidisciplinary thinking.

In the contemporary educational landscape, fostering a collaborative environment is another beneficial aspect of interdisciplinarity. By breaking with the isolated sharing of knowledge, interdisciplinary practice stimulates dialogue between students and educators. This exchange of perspectives and experiences not only solidifies knowledge, but also develops social and emotional competencies. According to Albrecht *et al.* (2023), interdisciplinarity "It is a combination of knowledge that enriches educational practice and favors dialogue between different areas of knowledge". Thus, the training of students who respect the diversity of opinions and who have communicative skills becomes a pressing need.

Furthermore, it is important to highlight that interdisciplinarity is perfectly aligned with the need to prepare individuals for integrated approaches to global problems. Contemporary issues, ranging from climate change to social inequalities, require solutions that consider multiple dimensions. Education, by stimulating interdisciplinary thinking, empowers students to develop innovative and connected responses to this complexity.

The way students perceive their own learning process is also impacted by interdisciplinarity. When they see themselves as active agents in the construction of knowledge, students tend to be more engaged in the proposed activities. This change in perspective accelerates their involvement, as they view the relevance of the content in a broader and more applicable way to their reality. Involvement is expanded through active methodologies that encourage participation and the resolution of everyday problems.

In this sense, the pedagogical practice that involves interdisciplinarity contributes to the formation of citizens who are more critical and aware of their role in society. Education should not be just a means to acquire technical knowledge; it should also promote understanding of the social and cultural relationships that shape community life. Barbosa and Carvalho (2022) state that "learning assessment must consider not only the knowledge acquired, but also the student's ability to integrate it into real contexts".

Training focused on interdisciplinarity also implies significant challenges. Educators need to rethink their practices and open up to collaboration between areas. In addition, the school curriculum should be reviewed to ensure that the connections between the contents are explicit and meaningful. Continuing education for teachers is essential for these professionals to feel comfortable and prepared to act in an interdisciplinary way.

In this context, initiatives that promote teacher training in interdisciplinary practices have gained prominence. The experience of teachers who teach mathematics, for example, reveals that the interdisciplinary approach can be a vector of innovation in teaching and learning practices. According to Ferreira *et al.* (2022), "interdisciplinarity is a transformative element that enables new ways of conceiving teaching and learning".

Therefore, the articulation between the disciplines is not limited to a pedagogical technique, but requires a commitment from educators to the construction of knowledge that reflects the interconnection of knowledge. This commitment contributes to the formation of a more dynamic and inclusive school space, where each student can find their place and their voice. In this way, the teaching-learning process becomes more meaningful, since the experiences lived by the students dialogue with their realities.

Furthermore, interdisciplinarity should be seen as a continuous process of discovery and relearning. Through interdisciplinary projects, students are encouraged to investigate, question and explore the relationships between different areas of knowledge. This active search for knowledge is a powerful stimulus for the development of critical thinking and creativity, which are fundamental for the formation of citizens prepared to face contemporary challenges.

In short, the implementation of interdisciplinarity in the school curriculum is configured as a transformative element, capable of enriching education by integrating knowledge and promoting the construction of essential competencies. As schools adopt this approach, they not only expand learning opportunities but also prepare students to function more effectively in an increasingly interconnected and complex world. Critical reflection, collaboration and integrity of knowledge become essential pillars for the formation of new generations of students.

METHODOLOGY

The methodology adopted in this research is organized in different stages, with the objective of ensuring a comprehensive understanding of interdisciplinarity in the school curriculum. Such an approach is characterized as qualitative, with a special focus on the practical application and theoretical construction of interdisciplinary dynamics. The objectives of the research include the exploration of the perceptions of educators and students about interdisciplinarity, as well as the analysis of the challenges and possibilities in its implementation in schools, based on Narciso and Santana (2025), who state: "The importance of interdisciplinarity in contemporary education is fundamental for the integral formation of the student" (p. 19460).

The method chosen for this study consists of a combination of literature review and case study. The bibliographic review is essential to theoretically support the research, allowing not only the identification and analysis of relevant theoretical conceptions about interdisciplinarity, but also the evaluation of existing practices. Subsequently, the case study provides a practical approach, selecting schools that have implemented interdisciplinary methodologies, allowing for a contrastive analysis between successes and challenges. According to Santana and Narciso (2025), "The analysis of practical cases is indispensable to understand the application of theories in the educational context" (p. 1580).

For data collection, several techniques were used, such as interviews, observations and document analysis. The interviews were conducted with educators and managers, aiming to capture different perspectives on the implementation of interdisciplinarity. The classroom observations allowed a direct visualization of the pedagogical practices, while the analysis of documents, such as lesson plans and interdisciplinary projects, provided a more comprehensive view of the strategies used. This set of techniques contributes to a deeper understanding of the phenomenon studied.

The research instruments used consist of semi-structured interview scripts and checklists for observation. The interview scripts were carefully designed to ensure that relevant issues about interdisciplinarity were addressed in a systematic manner. The observation checklists included aspects related to pedagogical practice, interaction between disciplines and student engagement in the proposed activities. This diversification of instruments is essential to ensure the validity and reliability of the data collected.

After data collection, the procedures for analysis were systematic and rigorous. The interviews were transcribed and analyzed based on the content analysis technique, allowing the identification of categories and recurring themes. Classroom observations were integrated with interview data to provide a holistic understanding of interdisciplinary

practices. Therefore, the interpretation of the data also considered the individual context of each school, ensuring a contextualized and detailed analysis.

Ethical aspects were carefully considered throughout the research. All stages were conducted respecting the rights of the participants, who were informed about the purpose of the research and the guarantee of anonymity and confidentiality. Informed consent was obtained before the interviews and observations were conducted, following the guidelines established by research ethics committees. This ethical concern is essential for the integrity of the study and respect for the subjects involved.

Although the proposed methodology seeks to be comprehensive, some limitations must be recognized. The sample was restricted to schools in a given region, which may limit the generalization of the results to other contexts. In addition, the qualitative nature of the research, although rich in details, may present subjectivity bias in the perceptions of the participants. These limitations should be seen as opportunities for future research that can broaden the understanding of interdisciplinarity in teaching.

Thus, the methodology presented in this research aims to integrate theory and practice, allowing a critical and reflective analysis of interdisciplinarity in the school curriculum. The dialogue between theoretical approaches and educational reality is fundamental for the progress of pedagogical practices, providing a space for educators and students to interact in a meaningful and contextualized way, contributing to a more complete and integrated education.

CASE STUDY

The analysis of specific cases in the field of education is a valuable methodology that allows a deeper understanding of interdisciplinarity in the school curriculum. This approach is particularly important, as it highlights how different disciplines can integrate in a way that enriches student learning. In contemporary times, several case studies have demonstrated both the challenges and opportunities that arise from the adoption of interdisciplinary curricula and their implications in the educational process.

A good example of this practice is found in a public school that implemented a project where the disciplines of Science and History are interconnected to address themes related to the environment. The proposal revolved around the central theme of sustainability. In this context, the teachers of these areas worked together in the creation of a pedagogical plan that contemplated both theoretical and practical activities. Students were encouraged to explore the history of sustainable practices in diverse cultures, while conducting experiments that investigated the environmental impact of specific behaviors. As

a result, a significant increase in student engagement was observed, as well as an improvement in their critical capacity in relation to the interactions between human actions and their environmental consequences.

The interconnected practice of the disciplines has not only improved students' understanding of sustainability, but has also fostered a collaborative learning environment. However, despite the positive results observed, the challenges faced in this teaching model cannot be ignored. The resistance of some educators to the new methodologies, the urgent need for continuing education and the difficulty in establishing an evaluation that reflects this intersection of knowledge are barriers that remain present. The educational literature emphasizes that it is essential to "develop a culture of collaboration among educators so that interdisciplinarity can be effectively implemented" (FREITAS, 2025).

The case studies also reveal the diversity of strategies that institutions have adopted to incorporate interdisciplinarity into their curricula. Each of them has unique characteristics that reflect the particularities of their school context. The exchange between different areas of knowledge, such as music and mathematics, for example, can facilitate the insertion of interdisciplinary content. As discussed by Gularce and Wolffebüttel (2023), "music education has the potential to articulate different disciplines, promoting more comprehensive and relevant learning."

In addition, cultivating an educational environment where interdisciplinarity thrives requires a clear vision of the pedagogical guidelines. This requires managers and educators to work together to develop strategic plans that effectively integrate the different areas of knowledge. Encouraging the exchange of experiences and good practices among teachers is a promising way to overcome resistance to change and promote continuous training that benefits the entire teaching team.

Another aspect to be considered is the evaluation of interdisciplinary practices. Often, traditional assessment methods are not sufficient to capture the plurality of knowledge involved in interdisciplinary curricula. For interdisciplinarity to be effectively recognized and valued, it is necessary to develop new evaluative approaches that consider integrated learning. "Assessment should reflect this complexity, enabling students to demonstrate their learning in a broader context" (LIMA; BRITO; COUTINHO, 2024).

Thus, case analysis allows us not only to draw an overview of what has already been done, but also to imagine future possibilities for education. Successful experiences, when well documented and shared, can provide significant learning for other institutions that wish to follow the same path. The interconnection of disciplines, therefore, should not be seen only as a challenge, but as an opportunity to innovate and transform teaching.

Interdisciplinarity in education, therefore, is an emerging need to prepare students for a dynamic and complex future. By addressing issues that require multiple perspectives, students become more critical and aware of the realities that surround them. This holistic training allows them to establish connections between knowledge, culminating in more meaningful and lasting learning.

Current educational policies should also provide support for the implementation of interdisciplinary curricula. As discussed by Libâneo *et al.* (2022), "policies should be oriented towards the integration of content, promoting the integral formation of the student". This highlights the importance of an alignment between the guidelines of the educational system and the pedagogical practices in schools, providing an environment favorable to interdisciplinarity.

In conclusion, the analysis of specific cases in the context of interdisciplinarity reveals a panorama full of challenges and opportunities. The experience of institutions that have already adopted interdisciplinary models is essential to support educational practices that meet contemporary demands. Thus, by promoting an education that transgresses the traditional boundaries of disciplines, we are preparing students not only for the present, but for a future in which knowledge must be widely interconnected and relevant to life in society.

FUNDAMENTALS OF INTERDISCIPLINARY EDUCATION

Interdisciplinary education is based on the premise that knowledge should be understood as an interrelated whole, rejecting fragmentation into isolated disciplines. This integral vision is essential to face the complexity of contemporary problems, which require a deeper and more comprehensive analysis. Pedagogical practices therefore need to be restructured, promoting not only the holistic understanding of knowledge, but also the development of critical, creative and analytical thinking among students.

In this sense, the contextualization of knowledge emerges as a fundamental pillar of interdisciplinary education. It is necessary to articulate academic content with social, cultural and environmental issues, so that learning becomes more meaningful and applicable to the students' reality. This approach not only enriches the educational process, but also provides students with tools to face real challenges in an interconnected world, where innovative and collaborative solutions are constantly in demand.

Promoting key skills for the 21st century, such as collaboration, effective communication and adaptability, is one of the key benefits of interdisciplinary education. Such skills are essential in a globalized and dynamic environment, and preparing students to develop them should be a priority in educational institutions. For this to occur, it is

essential that there is a commitment on the part of educators and managers to reimagine the educational process, overcoming resistance to the integration of knowledge.

However, the implementation of interdisciplinary education is not without its challenges. The traditional educational model, which values specialization and promotes competition between disciplines, often becomes an obstacle to pedagogical innovations. To overcome this barrier, a joint effort is needed that involves educational institutions, educators and policy makers, creating an environment that favors continuing education and the appropriation of active methodologies.

In this context, Lopes *et al.* (2022) highlight the importance of considering teachers' perceptions of interdisciplinarity in training. The experiences and visions of educators can enrich the process of building this practice, ensuring that it is appropriate to the realities of the classrooms. In addition, a continuous reflection on these perceptions can lead to an evolution in the methodologies applied.

Another relevant aspect concerns the diversity of methods that can be used in interdisciplinary education. Technology, for example, is an important ally in this process, allowing the creation of authorial and digital materials that connect different areas of knowledge. Marques *et al.* (2024) indicate that digital technologies play a fundamental role in the construction of educational materials that favor interdisciplinarity, expanding the possibilities of interaction and learning.

The training of educators also deserves special attention, as they are the ones who implement interdisciplinarity in daily practices. Providing training that values curiosity and openness to new approaches is essential. This training should be dynamic, offering practical experiences that encourage critical reflection on the teaching practice itself and on the role of interdisciplinarity in student learning.

Evaluation, traditionally focused on isolated results, will also need to be reformulated. New criteria, which consider the integration between disciplines and the practical application of knowledge, must be developed. A more holistic evaluative approach will allow educators to recognize their students' advances in interdisciplinary contexts and promote more effective learning.

In addition, the involvement of the school community, including parents and guardians, is fundamental for the success of interdisciplinary education. Building an environment that values school-community collaboration can provide significant support in the learning and development process of students. This strengthens the idea that education transcends the physical space of the classroom and extends to the social and cultural life of students.

In summary, interdisciplinary education represents an innovative educational philosophy that seeks to integrate knowledge and practices, promoting a richer and more relevant form of learning. The challenges are many, but the opportunities that this approach offers for the integral development of students are undeniable. By embracing this change, educational institutions will be better preparing their students for the challenges of today's world, where the interconnection between different areas of knowledge is more important than ever.

FINAL CONSIDERATIONS

The present research aimed to examine the practices of interdisciplinarity in education, highlighting the importance of this approach for the formation of individuals able to face contemporary challenges. Through a comprehensive analysis, we identify the main obstacles that hinder the implementation of interdisciplinary curricula, as well as highlight the potentialities that this integration can offer to the educational process. The research revealed a tension between traditional educational structures and the need for adaptive education that promotes meaningful and contextualized learning.

The results obtained indicate that the adoption of an interdisciplinary perspective not only enriches learning, but also favors the development of essential skills, such as critical thinking and creativity. The research showed that teacher training is a determining factor for the success of interdisciplinary practices. Educators need to be trained to create connections between different disciplines, transforming the school environment into a dynamic space for the exchange and construction of knowledge. This change is not merely structural, but also involves a redesign of the role of the teacher and the student in the construction of knowledge.

In the analysis of the data, it was possible to confirm that interdisciplinarity contributes significantly to prepare students to deal with a world in constant transformation. The ability to move between different areas of knowledge has been configured as a competitive advantage that can open doors to innovations and creative solutions in different contexts. The research found evidence that this curricular approach is aligned with the demands of the contemporary labor market, which values skills that go beyond the simple memorization of content.

While the results are promising, the research also identified significant limitations, such as resistance to change on the part of institutions and educators, as well as a lack of resources and adequate infrastructure for the implementation of interdisciplinary curricula. The study suggests that, for interdisciplinarity to become a consolidated practice in schools,

institutional commitment and more robust support from educational policies that favor curricular flexibility and innovation are needed.

Regarding future investigations, it is recommended that studies be carried out that explore successful cases in the implementation of interdisciplinary practices, with a special focus on varied contexts. These analyses may contribute to the development of guidelines that guide educational institutions and educators in the construction of more integrated and relevant curricula. In addition, the research suggests the need for longitudinal studies that evaluate the impact of interdisciplinary practices over time on student education.

Finally, when reflecting on the impact of this work, it is possible to argue that research on interdisciplinarity is not only about the construction of a new pedagogical model, but about the formation of critical and well-informed citizens. The strengthening of interdisciplinarity in the school curriculum can be a decisive step towards building a more just and conscious society, which values the diversity of knowledge and collaboration between different areas of knowledge.

In conclusion, the promotion of interdisciplinarity should be seen as a collective goal, which involves educators, managers, students and the community. The work presented here highlights the urgency of inverting the current educational logic, adopting an approach that prioritizes the interconnection between knowledge, thus promoting learning that prepares individuals not only for the world of work, but for life in society. The education of the future should undoubtedly be characterized by the integration and collaboration between disciplines, reaffirming the role of the school as a space for the collective construction of knowledge.

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