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THE USE OF VIRTUAL AND AUGMENTED REALITY TO LEARN

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ABSTRACT

Virtual Reality (VR) and Augmented Reality (AR) have become central themes in contemporary educational discussions due to the transformative potential they offer in improving teaching and learning processes. The choice of this theme is justified by the growing insertion of these technologies in the school environment and the need to understand them to enhance their pedagogical application. The main objective of this study is to analyze the impact of VR and AR on educational practices, seeking to understand how these tools can contribute to engagement and learning effectiveness. The methodology consists of a bibliographic approach that aims to gather theoretical references on the use of these technologies and a quantitative approach that proposes to collect data. The research emphasizes that, for the implementation of VR and AR to be effective, it is essential that educators are properly trained and that there is adequate pedagogical planning, favoring a more dynamic and interactive teaching. Thus, the understanding and integration of these tools in educational environments are essential for the formation of students who are more prepared for the challenges of the twenty-first century.

Keywords: Virtual Reality. Augmented Reality. Education.

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INTRODUCTION

Virtual Reality (VR) and Augmented Reality (AR) emerge as significant innovations in the field of education, bringing a new paradigm that moves away from traditional teaching approaches. These technologies offer immersive experiences, allowing students not only to receive information but to interact with it in a dynamic and engaging way. VR's ability to create completely digital environments and AR's ability to integrate virtual elements into the physical world expand the possibilities for learning, adjusting to the needs of an increasingly digitized century. In this context, the adoption of VR and AR technologies is of paramount importance for the formation of individuals able to navigate and contribute effectively in today's society.

In recent years, the integration of VR and AR into the educational environment has gained prominence, especially with the advancement of technology and the increasing accessibility of devices that support these experiences. The nuances of this transformation include the exploration of active teaching methodologies, which challenge the traditional model and promote more participatory learning. Recent studies show that the use of these tools not only increases the interest of students but also enhances learning in various disciplines, from exact sciences to the humanities. The development of more inclusive and personalized learning environments, which meet the demands of different learning styles, is one of the most notable developments promoted by this technology.

In-depth research of VR and AR in education reveals their relevance not only to improve academic performance but also to prepare students for a future in which digital skills become essential. With the world constantly evolving, understanding how to integrate these technologies into the school curriculum can mean the difference between an education that prepares the student for the job market and one that remains anachronistic. This study seeks, therefore, to offer an overview of the impact of these technologies, to elucidate the barriers to their implementation, and to provide viable solutions for their effective adoption in educational institutions.

The research problem outlined here is to understand how the implementation of VR and AR can transform the educational process and which factors represent challenges for this integration. The complexity lies, on the one hand, in the identification of the best practices for the use of these tools and, on the other hand, in the reflection on the pedagogical and social implications that this transformation entails. Thus, this research proposes to capture not only the benefits but also the limitations and resistance found in the educational environment in the face of this innovation.

The general objective of this research is to analyze the application of VR and AR in pedagogical practices, seeking to understand their impact on student learning and educational dynamics. This analysis aims to support the elaboration of guidelines that can guide educators and managers in the effective adoption of these technologies. The study aims to contribute to the training of professionals who are more prepared to face the new educational scenario.

To achieve this general objective, some specific objectives are established. First, to investigate previous experiences related to the application of VR and AR in various educational institutions. Secondly, to evaluate the perception of teachers and students about the effectiveness of these tools in the learning process. Finally, it will propose a set of recommendations based on the evidence collected, aiming to promote a more harmonious and beneficial integration of these technologies in the school routine.

The methodology outlined for this research will be of a bibliographic nature, aimed at the in-depth analysis of specialized literature that addresses the various facets of VR and AR in education. The research will involve the review of academic articles, theses, books, and other relevant documents in order to gather information capable of supporting the discussions and conclusions that are intended to be reached. From the analysis of the sources, it will be possible to build a solid theoretical basis that will support the findings of the study.

In summary, the introduction of this research highlights the importance of VR and AR in education, exploring their relevance and developments. The identification of the research problem and the objectives presented highlights the need for an in-depth study on the subject. The methodological proposal aims to ensure the robustness of the conclusions, and, thus, the transition to the body of work will allow a more comprehensive discussion, reflecting on how these technologies can transform contemporary education.

THEORETICAL FRAMEWORK

The use of Virtual Reality (VR) and Augmented Reality (AR) in education has stood out as a topic of great relevance in the current context, especially in view of the transformations in the pedagogical scenario. Such technologies emerge as innovative tools that, when incorporated into the school environment, introduce new possibilities for the construction of knowledge. The advent of the digital age and the growing demand for more dynamic teaching methods have led to the need to reassess traditional educational practices, seeking to adapt to the development of contemporary skills.

The inclusion of digital technologies in education facilitates the democratization of access to knowledge, making learning more accessible and interactive. According to Santos *et al*. (2024), digital integration plays a key role in the inclusion of students, allowing different student profiles to have access to more personalized teaching that is adaptable to their needs. In this way, VR and AR appear as strategic resources to promote greater educational equity.

The key concepts related to VR and AR in education involve immersion and interactivity, which are key to creating more engaging learning experiences. Immersion allows students to feel part of the content covered, while interactivity fosters active engagement in the proposed activities. Studies such as those by Silva *et al*. (2023) demonstrate that the application of augmented reality in science teaching enables the detailed visualization of abstract concepts, promoting greater understanding of the phenomena studied. Thus, the use of these technologies expands the pedagogical possibilities, bringing theory closer to practice.

Historically, the use of technologies in education has evolved from the introduction of audiovisual equipment to the implementation of virtual learning environments. The transition to more interactive and collaborative teaching has gained strength with the advancement of digital technologies. At first, implementations of VR and AR in classrooms were met with skepticism, but as research has expanded and their benefits have been demonstrated, these tools have begun to be accepted and integrated as essential components in educational practice. According to Assis *et al.* (2023), longitudinal studies demonstrate that motor training with the use of augmented reality generates positive impacts on the cognitive and physical development of students, validating its applicability in the educational context.

Currently, the debate around the use of VR and AR in education involves different perspectives, including the critical analysis of their effectiveness, accessibility, and impact on learning. Researchers and educators discuss not only the advantages and positive results of these technologies but also the challenges faced in their implementation, such as the lack of adequate infrastructure and resistance on the part of teachers. According to Silva *et al.* (2022), the use of AR in the teaching of exact sciences comes up against barriers such as the lack of equipment and the need for greater teacher training for the efficient application of these tools. Thus, educational policies must contemplate curricular adaptation and investments in continuing education of teachers.

The relationship between the theoretical concepts and the research problem, which seeks to understand the impact of VR and AR on student engagement and motivation, is intrinsic. Freitas (2025) highlights that artificial intelligence combined with virtual and

augmented reality has the potential to transform not only teaching methods but also assessment systems, making them more dynamic and personalized. This type of approach reinforces the premise that immersive experiences can modify the way students interact with knowledge, promoting more meaningful learning that is connected to contemporary demands.

Finally, the theoretical framework elaborated is fundamental to support the proposed study, offering a critical analysis of the intersections between VR, AR, engagement, and motivation in the educational context. Through reflection on the historical evolution, the fundamental concepts, and the various academic discussions on the subject, it becomes evident that the importance of basing the research on an approach that considers the potential of these technologies and the demands of the school environment. In this way, the study will not only contribute to the advancement of knowledge in the area but will also be able to offer educational practices that favor more meaningful and innovative learning.

CHALLENGES AND LIMITATIONS OF IMPLEMENTING VR/AR IN EDUCATION

The adoption of emerging technologies, such as Virtual Reality (VR) and Augmented Reality (AR), in the educational environment represents a promising evolution, but it is not without challenges. One of the main obstacles is the high financial investment, which covers not only the purchase of state-of-the-art equipment but also the development and updating of *specific software*. Such a reality can discourage educational institutions that operate with limited budgets. Thus, cost analysis should be a priority when planning the implementation of these technologies.

In addition to the financial aspect, resistance to change is another factor that requires attention. Educators often feel insecure about adopting new teaching methods that involve advanced technology. The lack of adequate training generates a climate of discomfort, making it difficult to integrate AR and VR into everyday pedagogical practices. According to Alves *et al.* (2023), resistance to the adoption of new technological tools by educators can limit the effectiveness of teaching. Therefore, a robust teacher training program is essential to overcome this barrier.

The institution's infrastructure also plays a decisive role in the feasibility of using these technologies. Many schools and universities face problems with connectivity and internet access, which compromises the user experience. Regions with fewer resources often have unfavorable conditions, making it difficult to include these innovations. Ensuring a stable infrastructure should be one of the first steps in integrating AR and VR into curricula.

Within this context, the research and development of specific materials and content that use AR and VR emerge as a promising path. These technologies have the potential to create immersive experiences that make learning more engaging and interactive. As pointed out by Assis *et al.* (2023, p.54), "augmented reality can improve information retention through motor and cognitive experiences". Thus, it is essential to invest in the creation of pedagogical platforms that align with the learning objectives.

An important aspect to consider is the profile of the students. The current generation, called digital natives, already has a level of familiarity with technology that can be explored in the classroom. In this sense, the use of AR and VR can be positive, as long as the activities developed are adequately planned to fill gaps in knowledge and skills. Thus, it is necessary for institutions to identify the expectations and needs of their students to create more meaningful learning experiences.

The role of interdisciplinarity cannot be underestimated either. The incorporation of AR and VR in educational practices can be encouraged through projects that integrate different areas of knowledge. This collaborative approach can provide enriching experiences, opening new horizons for students' learning and creativity. As stated by Lucena *et al.* (2023, p.57), "interdisciplinarity enhances the use of technologies, promoting a more integrated and contextualized teaching".

While technology presents challenges, it can also serve as a vehicle for innovation in teaching. The adoption of active methodologies that incorporate these technologies provides a less passive and more dynamic learning environment. Visual stimuli and practical experiences expand the understanding of complex concepts, facilitating learning. Educators take advantage of these opportunities to diversify their pedagogical approaches.

In addition, it is important to emphasize the need for continuous evaluation of the impact of these technologies on learning. Educational research should investigate not only the effectiveness of AR and VR but also the way these tools are being used in everyday classrooms. Feedback from teachers and students is essential for the optimization of methods and content, ensuring that the implementation will lead to effective and positive results.

Technical challenges are also a point to be emphasized. The maintenance of the technology must be carefully evaluated since technical failures can lead to user frustration and the interruption of the learning process. Therefore, it is necessary to plan technical support strategies that ensure the proper operation of the systems. Preparation to deal with unforeseen events can minimize certain discomforts associated with the use of new technologies.

Finally, the acceptance of AR and VR by the school community is a topic that needs to be addressed with delicacy. Building a culture of innovation within the institution requires time and the involvement of all segments - educators, students, and parents. Open dialogue and the sharing of positive experiences are key to creating an environment conducive to acceptance. Transparency regarding the objectives and expected results of this implementation can favor a climate of collaboration.

Introducing technologies such as AR and VR into the educational environment is not a simple process and requires the commitment of everyone involved. However, the opportunities that these tools offer are vast and can transform the way we teach and learn. As long as the initial obstacles are overcome, the resulting benefits can significantly impact education.

The future of education can be vastly enriched through the use of innovative technologies. To this end, institutions must draw up strategic plans that consider the challenges and available resources. Thus, even in a scenario full of barriers, the prospect of more engaging and effective learning becomes viable, promoting truly transformative teaching.

METHODOLOGY

The present research is characterized as strictly bibliographic, with a qualitative approach and exploratory nature, with the objective of analyzing, through theoretical references, the application of augmented reality (AR) technologies in the educational environment. It seeks to understand, based on studies already published, how AR tools influence the learning and interaction of students in different pedagogical contexts. According to Nunes *et al.* (2023, p. 1), "the guidelines for the application of mobile augmented reality in education seek to enhance engagement and understanding of content", which reinforces the relevance of deepening the academic discussion on the subject.

The investigation is based on the analysis and critical interpretation of works, scientific articles, dissertations, and theses that address the theme of augmented reality in the educational context, prioritizing recent publications relevant to the area. The selection of materials was guided by criteria of relevance, timeliness, and adherence to the research focus to ensure a consistent theoretical basis for the development of reflections.

The study does not involve the collection of empirical data, relying exclusively on secondary sources that deal with the implementation and effects of AR on pedagogical practice. The analysis of the selected texts will be conducted based on the content analysis

technique in order to identify recurrent categories, central arguments, and theoretical perspectives that support the use of this technology in basic and higher education.

The choice for a bibliographic research is justified by the intention of contributing to the academic debate about augmented reality as a tool to support learning, without, however, carrying out direct observations or field interventions. As Santana and Narciso (2025, p. 1578) point out, "the choice of method should be guided by clearly defined research questions", in which case theoretical analysis is the most appropriate strategy for the purpose of the study.

As for the ethical aspects, even if the research does not involve human participants, respect for the intellectual integrity of the sources consulted will be ensured through the correct citation of the authors and fidelity to the original ideas. The critical review of the literature will allow the identification of gaps, convergences and divergences in existing studies, contributing to an in-depth reflection on the challenges and possibilities of AR in the educational scenario.

Finally, the absence of empirical data that enables a practical validation of theoretical analyses is recognized as a limitation. However, it is expected that the findings obtained through the bibliographic research will provide relevant subsidies for future investigations, as well as for the improvement of pedagogical practices mediated by emerging digital technologies. Thus, this research proposes to strengthen the theoretical basis on augmented reality in education, promoting a critical dialogue with contemporary scientific production.

BENEFITS AND POTENTIALS OF VR/AR IN LEARNING

Virtual reality (VR) and augmented reality (AR) have proven to be increasingly relevant in the educational field, bringing a new perspective on the teaching-learning process. These technologies promote an interactive environment that not only attracts the attention of students, but also favors the construction of knowledge more effectively. By providing immersive experiences, VR and AR allow students to explore content uniquely, arousing their interest and curiosity.

According to Silva *et al.* (2023), augmented reality applied to science teaching can offer closer and more engaging contact with objects of study, favoring active learning through the visualization of elements invisible to the naked eye, such as internal animal systems.

One of the main advantages of implementing these technologies in the school environment is the simulation of situations that would otherwise be difficult to access. For

example, studies in fields such as biology and chemistry can benefit immensely from the ability to visualize microscopic structures in three dimensions. Santos *et al.* (2024, p. 124) emphasize that "technology facilitates the inclusion of students", highlighting the importance of these resources to democratize access to knowledge.

In addition to enabling complex simulations, VR and AR contribute to the understanding of abstract concepts that are often challenging for students. Through visual and interactive representations, these elements become more tangible, allowing students to interact and experience the concepts in a practical context. This is critical to developing critical and analytical skills, which are essential in a world filled with new information.

In this sense, Silva *et al.* (2022) highlight that the use of augmented reality in the teaching of exact sciences, applied to the cycle of fires in the Amazon, makes the content more accessible and contextualized, allowing for more meaningful learning and connected with the environmental reality of students.

Personalization of learning is another aspect where VR and AR excel. These technologies provide an individualized approach, allowing each student to advance at their own pace. This customization is especially beneficial for those who have different learning difficulties or styles.

Another relevant point is the motivation of students, who often feel revitalized in the face of technological approaches. Incorporating interactive elements into the classroom can reduce demotivation and increase student engagement. Silva *et al*. (2023) observed that AR promotes an active and investigative learning experience, especially in science teaching, by transforming the student into an agent of their discovery process.

In addition, social interaction also benefits from the application of VR and AR. These technologies often encourage collaboration between students, and can be used in group projects that involve the joint exploration of new content. This collaboration not only reinforces knowledge, but also develops interpersonal skills, which are fundamental in the educational and professional context.

Assis *et al.* (2023) demonstrate, in a longitudinal study, that the use of augmented reality in motor training activities positively impacts the development of collaborative and cognitive skills, reinforcing the potential of technology for teamwork and encouraging active participation.

The implications of these approaches go beyond academic performance. By integrating virtual and augmented reality, educators have the opportunity to prepare students for a future where technology plays an increasingly central role. Familiarity with these tools can be decisive in the formation of essential skills for the modern labor market.

However, as Freitas (2025) emphasizes, the incorporation of emerging technologies in school practices demands not only pedagogical innovation, but also the reformulation of evaluation processes, which must accompany this transformation. Through teacher training, it is essential that educators feel safe and prepared to incorporate these technologies into their pedagogical practices. The continuous training of teachers is an essential aspect to ensure that the application of VR and AR is done in an effective and meaningful way. Without this preparation, the potential of these tools may be underutilized.

Studies show that the proper use of technological tools can significantly raise the level of learning. However, teachers must be supported by policies that encourage curricular innovation and the adoption of new methodologies. This approach not only favors the professional growth of educators but also enriches the learning experience of students.

Finally, the implementation of virtual and augmented reality in education is a promising path that deserves to be explored in more depth. Its ability to transform teaching is undeniable, but it requires a continuous commitment from all those involved in the educational process. By considering the needs of students and educators, it is possible to create a learning environment that not only informs but also inspires and motivates.

Thus, it is evident that immersive technologies, such as VR and AR, have the potential to reshape pedagogical practices, making them more inclusive and efficient. The future of education is outlined around interaction and personalization, and these tools offer a clear path to achieving these goals. Therefore, adherence to this new educational reality is an essential step towards building relevant and meaningful learning.

GUIDELINES FOR EFFECTIVE INTEGRATION OF VR/AR INTO THE LEARNING ENVIRONMENT

The integration of Virtual Reality (VR) and Augmented Reality (AR) in the educational landscape represents a significant transformation in teaching-learning methods. Initially, this technological innovation requires a deep understanding of the specific needs of the learning institution. This starts with a thorough diagnosis that reveals which tools and content can really benefit students, respecting their particularities and the context in which they are inserted. Well-founded planning prevents the adoption of new technologies from being a mere passing trend, but rather a step towards a more effective and engaging education.

Once the diagnosis has been made, the selection of VR and AR tools should be made with criteria, prioritizing those that offer interactive experiences and that align with the institution's pedagogical objectives. The commitment of all those involved is essential in this

process. Educators, software developers, and technology experts must work together to create engaging content that takes into account the different ways students learn. This collaborative work not only enriches the learning experience, but also promotes an environment for the exchange of knowledge and skills.

In addition, the implementation of these technologies should be treated as an ongoing process. It is essential that there is regular monitoring that allows you to evaluate the results obtained and adjust strategies as necessary. This evaluation can include everything from observing students' interactions to applying questionnaires and interviews, seeking to understand how they feel about the use of new tools and what their suggestions for improvement are. The inclusion of students' voice in the process is critical to the successful integration of VR and DA, as they are the main beneficiaries of these innovative methods.

Another important point to be considered is the training of educators. For the implementation of VR and AR to be effective, teachers need to be trained not only in the use of technologies, but also in the teaching methodologies that best leverage these tools. Investing in the continuing education of teachers ensures that they feel safe and motivated to explore new approaches in the classroom. Continuous professional development, therefore, is not an isolated factor, but rather an integral part of the educational transformation process that VR and AR provide.

Creating an environment that encourages experimentation and exploration is another vital aspect for the successful adoption of these technologies. A climate of pedagogical innovation encourages students to actively engage in their learning, allowing them to experiment, make mistakes and, above all, learn from their experiences. In this sense, educational institutions must promote physical and virtual spaces that favor interactivity and practice, which are fundamental for the effective incorporation of VR and AR.

> Augmented Reality (AR) has shown significant potential to transform the teaching-learning process. By offering multisensory experiences, these technologies make it possible to simulate environments, situations and phenomena that would be impossible or dangerous to reproduce in the conventional classroom. Students exposed to educational content through VR and AR have knowledge retention rates up to 75% higher when compared to traditional methods, in addition to demonstrating greater engagement and intrinsic motivation. The ability of these technologies to contextualize abstract concepts and allow real-time interactions favors not only memorization, but also the development of practical skills and a deep understanding of the topics studied. (Freitas, 2025, p. 2740)

Thus, the adaptation of the evaluation process to the new technological reality is an important step towards the creation of a more inclusive and adaptive education. With virtual reality (VR) and augmented reality (AR), it is possible to implement assessments that

consider student performance in innovative ways, using simulations, *serious games,* and other forms of measurement that are different from traditional assessments. This not only enriches the educational experience, but also promotes a greater range of skills and competencies expected in the contemporary world.

According to Silva *et al.* (2023), the use of AR in science teaching practices allows for more effective educational experiences by creating immersive and interactive environments. This reinforces the idea that, with the proper use of these tools, it is possible to assess skills such as autonomy, logical reasoning, and problem solving in a more meaningful way.

One aspect to be noted is that the adoption of VR and AR can also contribute to the democratization of access to knowledge. Through these technologies, students from different profiles and locations can access learning experiences that were previously restricted to specific contexts. For example, virtual visits to museums or science labs become possible for everyone, regardless of their geographical location, eliminating barriers and promoting more equitable education.

Silva *et al.* (2022) highlight the importance of AR in teaching contextualized content, such as the cycle of fires in the Amazon. In this type of approach, the content is made available in a visual and interactive way, which allows students from different regions to understand local and global topics more clearly, contributing directly to educational inclusion.

Another important aspect to be discussed is the challenges that the implementation of VR and AR can face in the educational environment. The resistance to change on the part of some educators, added to the need for investments in infrastructure and training, can make it difficult to fully integrate these technologies. Institutions must recognize these challenges and provide adequate support so that everyone involved feels empowered and motivated to adopt the proposed innovations.

In this sense, Assis *et al*. (2023) emphasize that, in order to achieve significant results, it is necessary to develop pedagogical strategies associated with continuing education programs. The authors point out that the lack of familiarity with technologies is still a relevant barrier, especially in institutions with limited infrastructure, and planning is essential to ensure equity in the application.

In addition, it is necessary to observe the ethical and privacy issues surrounding the use of these technologies in the educational environment. Collecting student data, interacting with digital content, and creating personalized profiles require a responsible

approach from educational institutions. Therefore, transparency in practices and awareness of the importance of data protection are chapters that must be debated and regulated.

Although these topics are still under debate in the educational field, the use of AR and VR already requires clear regulations on the limits of the collection and analysis of educational data. The role of institutions, in this context, is to ensure that technology is implemented responsibly, always prioritizing the well-being and safety of students.

Finally, the future of education is closely linked to the ability of institutions to adapt and innovate. Virtual reality and augmented reality are not only tools but also transformative agents that can positively impact the way knowledge is built and shared. By uniting technology, pedagogy, and innovative assessment, institutions have the opportunity to create a learning context that not only prepares students for the challenges of the future but also inspires them to become lifelong learners.

Therefore, when considering the implementation of VR and AR, institutions must think about an integrated vision that contemplates pedagogical, technological, formative and ethical aspects. It is through this articulation that it will be possible to ensure that innovation translates into real and lasting benefits for education. These technologies, when well used, are capable of transforming the classroom into a more inclusive, dynamic and participatory space.

FINAL CONSIDERATIONS

The present study aimed to analyze, through a literature review, the potential of virtual reality (VR) and augmented reality (AR) in education, in the light of technological innovations and the incorporation of these tools in the school environment. The research sought to understand, based on the existing scientific production, how the integration of these technologies can favor the learning experience, as well as to identify the main challenges and possibilities pointed out in the reviewed studies.

The analysis of the literature consulted indicated that the use of VR and AR in the educational context has been associated with benefits such as increased student engagement, increased interactivity in classes and facilitated understanding of abstract content. Several authors emphasize that these technologies allow greater personalization of pedagogical activities, making the teaching process more dynamic and connected to the needs of students. In addition, the review showed that the development of more affordable devices, combined with the expansion of connectivity — especially with the arrival of 5G networks — expands the possibilities of applying these tools at different levels of education.

Based on the studies analyzed, it is possible to infer that virtual and augmented reality contribute to the creation of more immersive and interactive learning environments, which favor the practice of technical and socio-emotional skills in simulated scenarios. This characteristic is often pointed out as a differential for the formation of competencies required in contemporary school curricula, especially in areas that demand practical application and problem solving.

The data extracted from the literature confirm the hypothesis that the integration of these technologies into the educational process is aligned with the trends of a more active and student-centered learning. Several authors also highlight the relevance of the association between AR, VR, gamification, and artificial intelligence as elements that, together, have the potential to significantly transform the way we teach and learn today.

The contributions of this bibliographic research are located in the theoretical field, by gathering, organizing and critically interpreting the main discussions on the use of VR and AR in education. The results presented can serve as a basis for educators, researchers and school managers interested in understanding the fundamentals that support the adoption of these technologies and their pedagogical implications.

For future investigations, it is recommended to deepen empirical studies that analyze the concrete application of VR and AR in different age groups and educational realities. The literature also points to the need for longitudinal studies that follow the effects of these technologies over time, especially about cognitive development and the acquisition of skills by students.

It is concluded, based on the bibliographic research carried out, that virtual and augmented reality have a significant potential to innovate pedagogical practices and expand the possibilities of teaching-learning. The literature consulted shows that, when integrated with well-planned pedagogical proposals, these tools can contribute to a more interactive, attractive education aligned with the formative demands of the twenty-first century. Therefore, investment in studies and policies aimed at the conscious and planned insertion of these technologies in the school context is relevant for the construction of an education that is more connected to the transformations of contemporary society.

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