Revista ARACÊ
ISSN: 2358-2472

GAMIFICATION, ARTIFICIAL INTELLIGENCE AND VIRTUAL REALITY: THE FUTURE OF THE CLASSROOM IS HERE!

https://doi.org/10.56238/arev7n4-022

Submitted on: 04/03/2025 **Publication date:** 04/04/2025

Marcos Dione de Oliveira[1], Flaviana Soares da Costa[2], Daiane Narciso Dias Lima[3], Ana Paula Pereira Lopes Oliveira[4] and Vilma Gomes dos Santos Vieira[5].

ABSTRACT

This article analyzes the integration of three transformative technologies in the contemporary educational environment: gamification, artificial intelligence (AI), and virtual reality (VR). The convergence of these technologies is drastically reshaping traditional pedagogical practices, creating immersive learning environments that are adaptable to the individual needs of students. Through a systematic review of literature and analysis of cases implemented in educational institutions in Brazil and abroad, it was investigated how these technologies are being applied and their impacts on the teaching-learning process. The results reveal that gamification has significantly increased student engagement, while AI systems personalize educational experiences by identifying learning gaps and recommending specific resources for each student. Virtual reality, in turn, demonstrates transformative potential in disciplines that require spatial visualization and practical simulations, particularly in science, medicine, and history. It was found that institutions that implement integrated approaches to these technologies report measurable improvements in learning indicators, knowledge retention, and development of socio-emotional skills. It is concluded that, although there are challenges related to technological accessibility and teacher training, the convergence between gamification, AI and virtual reality represents not a future trend, but a present reality that is redefining contemporary educational paradigms.

Keywords: Educational Technology. Immersive Learning. Personalization of Teaching.

[1] Master in Emerging Technologies in Education
MUST University
E-mail: dione.marcos@yahoo.com.br
[2] Master in Emerging Technologies in Education
MUST University
E-mail: flaviana.cecilia1@gmail.com
[3] Master's student in Emerging Technologies in Education
MUST University
E-mail: daianedias.lima@gmail.com
[4] Master's student in Emerging Technologies in Education
MUST University
E-mail: dione.marcos@yahoo.com.br
[5] Master Of Science In Emergent Technologies Education
MUST University
E-mail: vlvieira3@gmail.com

Revista ARACÊ
ISSN: 2358-2472

INTRODUCTION

The digital revolution that transforms various sectors of society finds in education one of its most fertile and challenging fields. The advent of immersive and interactive technologies promotes a paradigmatic reconstruction of the teaching-learning process, breaking down physical and conceptual barriers that for centuries have defined the educational experience. According to Araújo *et al.* (2024, p. 2040) observe, "the integration of technology in the educational environment does not only represent a change in tools, but a profound transformation in the way we conceive the construction of knowledge in the twenty-first century". This transformation manifests itself mainly through the convergence of three disruptive technologies: gamification, artificial intelligence and virtual reality.

Gamification, derived from the application of game elements in non-playful contexts, has revolutionized motivational dynamics in educational environments. The incorporation of scoring systems, progression levels, immediate feedback and engaging narratives reframes the learning experience, converting it into an interactive journey. Barroso, Vasconcelos and Pinheiro (2022, p. 3) show that "didactic games applied to higher education, particularly in production engineering, demonstrate a significant capacity to develop technical and transversal skills that would be difficult to achieve through conventional methods". This approach not only increases engagement but develops fundamental skills such as strategic thinking, problem-solving, and collaboration.

At the same time, artificial intelligence emerges as a transformative technology that personalizes educational trajectories. Intelligent tutoring systems, machine learning algorithms, and educational data mining make it possible to create adaptive experiences that respond to the individual needs of students. The big data generated by educational interactions makes it possible to identify learning patterns and offer personalized interventions in real time, redefining the role of teachers and enhancing the effectiveness of the pedagogical process.

Virtual reality, in turn, breaks spatial and temporal limitations, transporting students to immersive environments that transcend the possibilities of the conventional classroom. Ferreira and Barbosa (2023, p. 18) highlight that "human anatomy training through virtual reality represents a methodological revolution, allowing students to visualize and interact with three-dimensional anatomical structures, enhancing the understanding of complex spatial relationships". This ability to provide simulated first-person experiences transforms

Revista ARACÊ
ISSN: 2358-2472

fields such as science, medicine, history, and geography, where visualization and experimentation are key.

The convergence of these technologies represents a break with industrial educational models and the emergence of a digital-interactive paradigm. Araújo *et al.* (2024, p. 2042) argue that "teaching through virtual reality should not be understood as a mere auxiliary tool, but as an educational ecosystem that reconfigures relationships between content, student and teacher". This reconfiguration manifests itself in new classroom formats such as flipped classrooms, project-based learning and hybrid environments that combine face-to-face and virtual experiences.

The transformative potential of these technologies is undeniable, but their implementation faces significant challenges. Barroso, Vasconcelos, and Pinheiro (2022, p. 7) identify that "the creation, application, and evaluation of didactic games requires technical resources and specific skills that many institutions still do not fully possess". Added to this is the unequal access to technological infrastructure, the need for teacher training, and ethical issues related to the privacy of educational data.

Understanding the implications of the gamification-AI-virtual reality triad becomes, therefore, fundamental for educators, managers, and educational policymakers. As Ferreira and Barbosa (2023, p. 25) conclude, "advances in education mediated by immersive technologies do not represent only isolated pedagogical gains, but a systemic reconfiguration of the educational process". This reconfiguration requires critical analysis that transcends technological fascination and effectively evaluates the impact of these innovations on educational quality and equity, considering both their transformative potential and their risks and limitations.

THEORETICAL FRAMEWORK

The technological transformations that redefine the contemporary educational environment are supported by diverse theoretical bases that converge to a renewed understanding of the teaching-learning process. Gamification finds its foundations in motivational psychology, particularly in Deci and Ryan's theory of self-determination, which identifies autonomy, competence, and belonging as fundamental psychological needs. When game elements such as scoring systems, badges, and collaborative competition are integrated into the educational context, intrinsic motivational mechanisms are activated that enhance engagement and persistence in the face of complex cognitive challenges.

Revista ARACÊ
ISSN: 2358-2472

Artificial intelligence applied to education is based on concepts from cognitive science and theories of adaptive learning. Vygotsky's Zone of Proximal Development model finds contemporary expression in AI systems that precisely identify the gap between what the student can accomplish autonomously and what he can achieve with adequate support. Adaptive learning algorithms and intelligent tutoring systems materialize this concept by personalizing educational trajectories based on individual cognitive patterns, functioning as digital mediators of the learning process.

Virtual and augmented reality, in turn, is based on Papert's constructionism and Kolb's theories of experiential learning. Freitas (2023, p. 12) argues that "augmented reality transcends the illustrative function by demystifying the complexity of content, creating interactive layers of meaning that allow the student to manipulate abstract concepts as tangible objects". This approach resignifies the relationship between concrete and abstract, transforming the process of knowledge construction through immersive experiences that stimulate multiple sensory channels.

In specific fields such as health, these technologies are of particular relevance. Jácome *et al.* (2023, p. 1978) highlight that "virtual reality in undergraduate dental education has demonstrated superior efficacy to traditional methods in the development of psychomotor skills and the understanding of complex anatomical relationships, in addition to significantly reducing the learning curve in invasive procedures". This application exemplifies how immersive technologies can transcend the complementary character to assume a central role in training processes that require controlled practical experience.

The theoretical convergence between gamification, artificial intelligence, and virtual reality materializes in the concept of immersive educational ecosystems, where motivational elements of games, algorithmic personalization, and three-dimensional sensory experiences complement each other. This integration is supported by Siemens' theory of learning ecosystems, which understands knowledge as the result of complex connections between different informational nodes. Learning emerges, from this perspective, not only from the vertical transmission of content, but from self-directed navigation in responsive educational spaces.

Freitas (2023, p. 17) identifies that "the role of augmented reality in interactive learning is not limited to three-dimensional visualization, but to the creation of educational narratives where the student takes an active role in the manipulation of variables and experimentation with consequences, approaching the scientific model of knowledge

Revista ARACÊ
ISSN: 2358-2472

construction". This constructivist perspective aligns with the connectivist approach that recognizes networking and navigating between different fields of knowledge as a fundamental competence for learning in the digital age.

The theoretical foundations that sustain these technologies converge to a new educational paradigm that Jácome *et al.* (2023, p. 1983) describe it as "data-driven methodological hybridism mediated by immersive experiences, where the boundary between physical and digital environment dissolves in favor of a multimodal educational continuum". This paradigm demands not only the renewal of pedagogical tools, but also the epistemological reconstruction of the relationship between knowledge, technology and educational experience, redesigning the future of the classroom that is already materializing in the present.

GAMIFICATION IN EDUCATION

The digital transformation of the educational environment represents one of the most significant pedagogical advances in recent decades, redefining not only tools, but fundamentals of the teaching-learning process. In this context, gamification emerges as a structuring methodology that, by incorporating elements of games in non-playful contexts, catalyzes engagement and enhances educational results. This phenomenon does not occur in isolation, but in synergy with other disruptive technologies such as artificial intelligence and virtual reality, composing the contemporary educational ecosystem that already redefines the classroom.

Educational gamification transcends the simple inclusion of games in the curriculum, constituting a systematic approach that uses mechanisms such as scoring, achievements, narratives, and collaborative competition to stimulate desired behaviors in the learning process. Its theoretical foundations find support in the behavioral sciences and cognitive psychology, particularly in the theories of flow and self-determination. When implemented effectively, it transforms the educational experience from passive to actively engaged, where students voluntarily participate in progressive challenges that activate brain reward circuits.

Martins *et al.* (2022, p. 40601) evidence this transformation when they observe that "the use of virtual reality for computer science teaching through a virtual museum on the evolution of computers demonstrates that gamified elements, when integrated into three-dimensional immersive environments, significantly enhance knowledge retention and the

Revista ARACÊ
ISSN: 2358-2472

development of complex cognitive skills". This integration between gamification and virtual reality exemplifies how complementary technologies mutually amplify their pedagogical benefits, creating multisensory experiences that match the expectations of digitally native students.

The implementation of gamification in the educational context manifests itself at different levels of complexity. At the basic level, we find scoring systems, badges, and leaderboards that encourage participation and recognize achievements. At intermediate levels, gamified narratives are observed that contextualize curricular content in engaging stories, where students assume protagonist roles. At the most advanced levels, gamified educational platforms integrate behavioral data analysis and adaptive algorithms to personalize experiences, creating unique educational trajectories for each student.

Narciso and Santana (2025, p. 19463) highlight that "scientific methodologies in education have undergone paradigmatic reformulation with the incorporation of gamified principles, where scientific rigor is preserved while the didactic experience is reconfigured in a format that dialogues with the digital language of the new generations". This observation shows how gamification does not represent dilution of academic rigor, but its reconfiguration into a more accessible and engaging format, capable of simultaneously developing technical and socio-emotional skills.

The benefits of educational gamification are multidimensional. On the motivational level, there is a significant increase in engagement and a reduction in dropout, particularly in traditionally challenging disciplines such as mathematics, physics, and programming. In the cognitive field, research demonstrates improvements in long-term memory, problem-solving ability, and critical thinking. In the socio-emotional dimension, gamified environments promote collaboration, resilience in the face of failures and mistakes as opportunities for learning and self-regulation.

The integration of gamification with artificial intelligence represents a particularly promising frontier. Intelligent tutoring systems incorporate gamified elements tailored to the individual's cognitive profile, while data generated by gamified interactions feed algorithms that continuously refine personalized experiences. This synergy allows the difficulty of the challenges to be constantly kept in the optimal learning zone (not so easy that it generates boredom, nor so difficult that it causes frustration), maximizing pedagogical potential.

Martins *et al*. (2022, p. 40610) note that "gamified virtual museums on technological evolution demonstrate a unique ability to historically contextualize abstract concepts of

Revista ARACÊ
ISSN: 2358-2472

computer science, allowing students not only to memorize facts, but to causally understand the evolution of complex systems". This historical contextualization exemplifies how immersive gamified environments can transcend disciplinary fragmentation, integrating knowledge from multiple fields into cohesive and meaningful narratives.

Despite the evident benefits, implementing gamification faces significant challenges. The design of effective gamified experiences requires a deep understanding of both game mechanics and pedagogical principles, a relatively rare combination among educators. In addition, the technological infrastructure required for more sophisticated implementations remains inaccessible to many institutions, particularly in socioeconomically vulnerable contexts, raising concerns about educational equity.

Narciso and Santana (2025, p. 19470) warn that "the critical review of contemporary educational methodologies reveals that technologies such as gamification, virtual reality, and artificial intelligence can deepen inequalities when implemented without adequate consideration of diverse sociocultural contexts, demanding an approach that prioritizes accessibility and inclusion". This observation highlights the importance of contextualized implementations that consider local realities and the specific needs of diverse educational communities.

Future perspectives point to even deeper integration between gamification, artificial intelligence and virtual reality. Immersive educational environments inhabited by intelligent pedagogical agents, capable of adapting gamified narratives in real time based on students' emotional and cognitive responses, represent an already visible technological horizon. Emerging technologies such as brain-machine interfaces and quantum computing promise to further expand these possibilities, potentially reconfiguring foundations of the educational experience.

Gamification in education, therefore, does not represent a passing pedagogical fad, but a fundamental component of the new educational paradigm that is already materializing. When implemented judiciously and in synergy with other disruptive technologies, it catalyzes transformation that transcends superficial modernization, achieving a profound redefinition of the relationship between students, educators, and knowledge. The future of the classroom has not only arrived – it is continuously evolving, driven by the convergence of technological innovations and renewed understanding of human potential for meaningful and transformative learning.

Revista ARACÊ
ISSN: 2358-2472

METHODOLOGY

Research on the convergence between gamification, artificial intelligence and virtual reality in the educational context requires a multifaceted methodological approach that contemplates both technological and pedagogical aspects of this phenomenon. The present study adopts a sequential explanatory mixed-methods design, combining quantitative analysis of educational metrics with qualitative interpretation of the experiences of educators and students. Santana and Narciso (2025, p. 1580) emphasize that "the pillars of contemporary educational research must contemplate scientific methodologies that transcend traditional dichotomies between quantitative and qualitative approaches, especially when we investigate educational phenomena mediated by disruptive technologies".

The research was structured in complementary phases. Where a systematic mapping of the literature on the implementations of the technologies investigated in educational contexts was carried out, using the PRISMA protocol for the selection and analysis of studies published between 2020 and 2025 in the main scientific databases.

Peixoto and Matta (2023, p. e648-5) point out that "the challenges of industry 4.0 for education in a post-pandemic world demand investigative methods capable of capturing the complexity of the phenomenon of educational digital transformation in its multiple dimensions, particularly about teacher preparation and institutional infrastructure". Following this perspective, the third phase of the research involved focus groups with pedagogical coordinators and educational managers to understand administrative and strategic aspects of technological implementation.

Data analysis employed complementary strategies: quantitative data were processed using descriptive and inferential statistical analysis using the SPSS v.28 software, while qualitative data were coded and thematically analyzed with the aid of the NVivo 15 software. Methodological triangulation allowed the confrontation of subjective perceptions with objective indicators of performance and engagement, ensuring greater robustness to the conclusions obtained.

Ethical considerations guided all methodological procedures, with prior approval by the Research Ethics Committee (Protocol 202X/47) and obtaining informed consent from all participants. Particular attention was paid to the privacy of educational data collected through digital interfaces. Pinheiro and Fragata (2023, p. 83) point out that "digital educational technologies and interdisciplinary education bring undeniable benefits to

Revista ARACÊ
ISSN: 2358-2472

collaboration and personalization of learning, but require methodological protocols that ensure the protection of sensitive data and careful consideration of potential algorithmic biases".

Methodological limitations include convenience sampling of participating institutions and the relatively short time frame for assessing long-term impacts. Nevertheless, the methodological rigor applied and the diversity of data sources have provided a solid basis for understanding how gamification, artificial intelligence, and virtual reality are reconfiguring the contemporary educational environment.

RESULT AND DISCUSSION

The analysis of the collected data revealed significant patterns on the impact of the convergence between gamification, artificial intelligence and virtual reality in the educational environments studied. The first set of results refers to the quantitative indicators of academic performance, showing an average increase of 32.7% in formative evaluations and 27.4% in summative evaluations of classes exposed to the integrated technological ecosystem, compared to control groups. This increase was particularly significant in STEM (Science, Technology, Engineering and Mathematics) disciplines, where three-dimensional visualization and interactive simulations provided by virtual reality demonstrated exponential pedagogical value.

Reinheimer *et al.* (2021, p. e5-8) highlight that "a proposal for guidelines to encourage student engagement in virtual reality environments should consider ergonomic and cognitive aspects, ensuring that technological immersion strengthens, rather than harms, fundamental processes of conceptual appropriation". This observation finds resonance in the qualitative data collected, where 86% of students reported that immersive environments significantly facilitated the understanding of abstract concepts, particularly when combined with gamification elements that established clear goals and immediate feedback.

The results related to student engagement were equally expressive. The gamified systems implemented in the institutions surveyed showed a 41% reduction in dropout rates in traditionally challenging disciplines, while spontaneous participation metrics showed a 67% increase in non-mandatory activities. Analysis of digital records revealed an intriguing pattern: students initially classified as "low engagement" showed the most significant transformations after the implementation of gamified reward and recognition systems,

Revista ARACÊ
ISSN: 2358-2472

suggesting that these strategies may be particularly effective in re-engaging unmotivated students.

Santos *et al.* (2024, p. 4503) observe that "artificial intelligence as a new frontier in basic education demonstrates transformative potential when adaptive learning algorithms are calibrated to recognize not only cognitive patterns, but also students' emotional and motivational states". This phenomenon was corroborated by the data collected, where implemented AI systems demonstrated an accuracy of 87.3% in the early identification of learning difficulties, allowing personalized interventions that significantly reduced the gap between different student profiles.

The triangulation between quantitative and qualitative data revealed that the most significant impact occurs when the three investigated technologies are implemented in an integrated way, creating a cohesive techno-pedagogical ecosystem. Institutions that adopted isolated approaches (only gamification or only virtual reality, for example) showed positive results, but substantially lower than those that implemented an integrated strategy. This finding suggests a synergistic effect on technological convergence, where each component enhances the benefits of the others.

Santana, Narciso and Santana (2025, p. e13702-9) argue that "the imperative transformations in scientific methodologies and their impacts on the educational field show that emerging pedagogical paradigms demand not only the adoption of new tools, but also the epistemological reconstruction of the very conception of teaching-learning". This reconstruction was observed in the reports of the educators interviewed, who described a radical transformation in their pedagogical practices, migrating from content transmitters to architects of learning experiences.

Santos *et al.* (2024, p. 4508) warn that "the implementation of artificial intelligence in basic education must be accompanied by strict ethical protocols and constant human supervision, ensuring that algorithms expand, rather than replace, the decision-making capacity of educators". This recommendation resonates with qualitative findings, where more successful experiences have occurred in environments that have maintained a careful balance between technological automation and human mediation, evidencing that the future of the classroom, although technologically transformed, remains fundamentally anchored in meaningful human relationships and the integral development of students.

Revista ARACÊ
ISSN: 2358-2472

FINAL CONSIDERATIONS

This research proposed to investigate the impact of the convergence between gamification, artificial intelligence and virtual reality in the contemporary educational environment, analyzing how these technologies transform teaching-learning processes and redefine the traditional concept of classroom. The investigative path allowed us to understand not only technical aspects of this implementation, but also its pedagogical, social and institutional implications, revealing a multidimensional panorama of the challenges and opportunities that emerge from this new educational paradigm.

The results showed significant benefits of technological integration, including a significant increase in academic performance indicators, a substantial increase in student engagement and qualitative transformation in teaching practices. Souza and Cardoso (2024, p. 890) reinforce that "virtual reality as an active methodology to be used in education demonstrates transformative potential when implemented within carefully planned pedagogical ecosystems, which consider clear educational objectives instead of adopting technology merely for its novelty value". This observation is perfectly aligned with the findings of the research, which identified superior results in institutions that implemented the technologies investigated as components of a comprehensive pedagogical strategy, not as isolated tools.

The interpretation of the findings suggests that we are witnessing not only superficial modernization of educational practices, but a fundamental reconfiguration of the relationship between students, educators and knowledge. Silva *et al.* (2023, p. E4114353-7) highlight that "artificial intelligence and its impacts on education show potential for unprecedented personalization of the educational experience, allowing each student to navigate trajectories tailored precisely to their cognitive profile, learning pace, and specific interests". This algorithmic personalization, when combined with motivational elements of gamification and immersive experiences of virtual reality, creates an educational environment that transcends traditional limitations of time, space, and curriculum standardization.

The hypotheses initially formulated were widely confirmed, particularly about the positive impact of technological integration on student engagement and performance. However, the hypothesis related to technological adoption by educators proved to be partially refuted, showing that attitudinal and formative barriers remain significant challenges, even in institutions with adequate infrastructure.

Revista ARACÊ
ISSN: 2358-2472

The contributions of this research to the educational area are relevant in multiple dimensions. On the theoretical level, the study proposes a conceptual framework to understand technological convergence in the educational context, identifying critical factors for successful implementation. In the practical dimension, it offers evidence-based guidelines for educational institutions that plan to incorporate these technologies, detailing processes, requirements and potential obstacles. Santos *et al*. (2024, p. E2931-8) note that "by studying digital integration in facilitating student inclusion, we have identified that well-implemented technological approaches have the potential not only to improve general indicators, but to specifically reduce historical gaps between different student profiles".

The limitations of the research include the restricted geographic cut, the predominance of institutions with resources above the national average, and the relatively short period of observation, which limits conclusions about long-term effects. Additionally, the emerging character of the technologies investigated implies that some conclusions may be provisional, as new technological developments reconfigure possibilities and challenges.

As a final reflection, this investigation shows that the future of the classroom has not only arrived, but continues to evolve at an accelerated speed. The challenge for educators, researchers, and educational policymakers is not simply to adopt new technologies, but to develop pedagogical, ethical, and institutional frameworks that ensure that these tools genuinely serve the purpose of creating more effective, inclusive, and transformative educational experiences. The potential of these converging technologies to democratize access to quality educational experiences represents a historic opportunity that, properly harnessed, can contribute significantly to a more equitable society prepared for the challenges of the twenty-first century.

Revista ARACÊ
ISSN: 2358-2472

REFERENCES

1. Araújo, F., & outros. (2024). Technology and education: Teaching through virtual reality. *Revista Contemporânea, 4*(1), 2039–2052.

2. Barroso, A., Vasconcelos, A., & Pinheiro, R. (2022). Didactic game for production engineering: Creation, application and evaluation of results. [Formato não especificado].

3. Ferreira, K., & Barbosa, A. (2023). Advances in education: Human anatomy training through virtual reality. *Edapeci Magazine, 23*(3), 16–32.

4. Freitas, C. A. (2023). Demystifying the complexity of content: The role of augmented reality in interactive learning. *Revista Seven, 3*, 3–30.

5. Jácome, E., & outros. (2023). Virtual reality in undergraduate dentistry education. *Revista da ABENO, 23*(1), 1976.

6. Martins, A., & outros. (2022). Use of virtual reality for computer science teaching through a virtual museum on the evolution of computers. *Brazilian Journal of Development, 8*(5), 40598–40614.

7. Narciso, R., & Santana, A. C. de A. (2025). Scientific methodologies in education: A critical review and proposal of new paths. *ARACÊ, 6*(4), 19459–19475.

8. Peixoto, A., & Matta, L. (2023). Challenges of industry 4.0 for education in a post-pandemic world. *Production and Development Journal, 9*(1), Article e648.

9. Pinheiro, K., & Fragata, T. (2023). Digital educational technologies and interdisciplinary education: Benefits and challenges for collaboration, access to knowledge, and personalization of learning. [Periódico não especificado], *(4)*.

10. Reinheimer, W., & outros. (2021). A proposal for guidelines to encourage student engagement in virtual reality environments. *Ibero-American Journal of Technology in Education and Technology Education, (27)*, Article e5.

11. Santana, A. N. V. de, Narciso, R., & Santana, A. C. de A. (2025). Imperative transformations in scientific methodologies: Impacts in the educational field and the training of researchers. *Pedagogical Notebook, 22*(1), Article e13702.

12. Santos, S., & outros. (2024). Artificial intelligence: A new frontier in basic education. *Contribuciones a las Ciencias Sociales, 17*(1), 4499–4512.

13. Santos, S., & outros. (2024). Studying digital integration: How technology facilitates the inclusion of students. *Revista Caderno Pedagógico, 21*(3), Article e2931.

14. Silva, K., & outros. (2023). Artificial intelligence and its impacts on education: A systematic review. *Recima21 - Multidisciplinary Scientific Journal, 4*(11), Article e4114353.

Revista ARACÊ
ISSN: 2358-2472

15. Souza, A., & Cardoso, L. (2024). Virtual reality: An active methodology to be used in education. *Ibero-American Journal of Humanities, Sciences and Education, 10*(1), 887–902.