







REVIEW

Learning in the Metaverse: Pedagogical Implications from the Student Experience

Aprender en el Metaverso: implicaciones pedagógicas desde la experiencia estudiantil

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ABSTRACT

Introduction: the metaverse has emerged as a technology with great potential to transform educational processes, generating immersive environments that invite us to rethink the way students learn and engage with knowledge. However, despite its growing adoption, a gap persists in our in-depth understanding of how students experience these experiences and the pedagogical implications they provide.

Objective: this article aimed to analyze, through a narrative review, the pedagogical implications derived from empirical studies on student experiences in metaverse-mediated educational environments, to identify patterns, challenges, and recommendations for instructional design.

Method: an exploratory narrative review was conducted of 50 original studies published between 2022 and 2024 in English and Spanish, using qualitative, quantitative, and mixed approaches. The analysis was organized around three research questions.

Results: the results show that the metaverse can increase student motivation, engagement, and collaboration, but it also presents technical, emotional, and pedagogical challenges that hinder its effective implementation.

Conclusions: it is concluded that the use of the metaverse in education requires a profound pedagogical redesign, accompanied by teacher training, digital inclusion, and a student-centered ethical approach.

Keywords: Immersive Learning; Pedagogical Design; Virtual Education; Student Experience; Metaverse.

RESUMEN

Introducción: el metaverso ha emergido como una tecnología con alto potencial para transformar los procesos educativos, generando entornos inmersivos que invitan a repensar la forma en que los estudiantes aprenden y se relacionan con el conocimiento. Sin embargo, a pesar de su creciente adopción, aún persiste un vacío en la comprensión profunda de cómo los estudiantes viven estas experiencias y qué implicaciones pedagógicas surgen de ellas.

Objetivo: este artículo tuvo como propósito analizar, desde una revisión narrativa, las implicaciones pedagógicas derivadas de estudios empíricos sobre experiencias estudiantiles en entornos educativos mediados por el metaverso, con el fin de identificar patrones, desafíos y recomendaciones para el diseño docente.

Método: se aplicó una revisión narrativa exploratoria de 50 estudios originales publicados entre 2022 y 2024 en inglés y español, con enfoques cualitativos, cuantitativos y mixtos. El análisis se organizó en torno a tres

preguntas de investigación.

Resultados: los resultados evidencian que el metaverso puede aumentar la motivación, participación y colaboración de los estudiantes, pero también presenta desafíos técnicos, emocionales y pedagógicos que afectan su implementación efectiva.

Conclusiones: se concluye que el uso del metaverso en educación exige un rediseño pedagógico profundo, acompañado de formación docente, inclusión digital y una mirada ética centrada en el estudiante.

Palabras clave: Aprendizaje Inmersivo; Diseño Pedagógico; Educación Virtual; Experiencia Estudiantil; Metaverso.

INTRODUCTION

Talking about the metaverse is no longer about imagining a distant future exclusive to science fiction. This technology is making a grand entrance into our classrooms, laboratories, and learning environments. With three-dimensional environments that allow students and teachers to interact through avatars, the metaverse offers immersive educational experiences that, until recently, were difficult to conceive. More than a technological fad, it is a new way of experiencing education. Platforms such as AltspaceVR, Roblox Education, and Spatial are already being used for classes, simulations, and even virtual graduation ceremonies (Fernández-Miranda et al., 2024; López-Belmonte et al., 2023; Qian et al., 2023; Diaz-Colón & Ereú-Ledezma, 2024).

However, although enthusiasm is understandable, a key question still has no clear answer: How do students experience these environments? Most current research focuses on the potential benefits of the metaverse – such as increased engagement or personalization of learning – but few stop to look at it from the student’s perspective. Do they feel like they are part of these environments? What excites them, what makes them uncomfortable, what would they change? This gap is significant because it is not enough to implement technologies; it is essential to understand how the people who learn inhabit them, interpret them and give them new meaning (Shi & Park, 2024; Mustafa, 2022; Aguas-Viloria & Buelvas-Sierra, 2024; Roman-Acosta, 2024a).

This article was born precisely from that concern. We want to focus on student voices, their experiences within the metaverse, and the pedagogical implications that can be derived from those experiences. Through a narrative review, our purpose is to analyze the pedagogical implications derived from empirical studies on student experiences in educational environments mediated by the metaverse to identify patterns, challenges, and recommendations that guide the design and improvement of teaching practices in these virtual spaces.

The relevance of this review is that the metaverse, beyond its technological potential, represents a pedagogical challenge: it forces us to rethink teaching, assessment, the role of the teacher, and student participation from new coordinates. In a context where more and more institutions are beginning to experiment with these environments, having a comprehensive synthesis of what is already known –and what is not yet known– about the student experience can make the difference between superficial innovation and profound educational change (González Ciriaco, 2024; Woick et al., 2024; Mkedder & Das, 2023; López et al., 2024; Roman-Acosta and Barón Velandia, 2023).

To this end, we have carried out a narrative review with an exploratory approach. We selected qualitative, quantitative, or mixed empirical studies published between 2022 and 2024 in English and Spanish that directly or indirectly addressed how students experience their time in educational experiences in the metaverse. This review identified thematic categories that allow us to take a closer and more comprehensive look at the contributions, limits, and pedagogical opportunities of this emerging phenomenon.

With this article, we hope to offer a more human, pedagogical, and critical look at the metaverse in education. Far from idealizing or dismissing it, we seek to understand it from those who inhabit it: the students (Gómez Loero, 2024; Moronta Diaz, 2024; Roman-Acosta et al., 2023). The text is organized into five sections: this introduction, the methodology used, the main findings organized into categories, a critical discussion, and, finally, the conclusions.

METHOD

To carry out this review, an exploratory narrative review approach was used, an ideal methodology when the objective is not to quantify effects or test hypotheses but to understand a complex phenomenon in a broad, contextualized, and critical way (Tomasina & Pisani, 2022; Roman-Acosta, 2024b). Unlike a traditional systematic review, which follows strict protocols for searching and synthesis, narrative review allows for integrating different methodological approaches (qualitative, quantitative, and mixed) and constructing an in-depth interpretation based on diverse sources. This strategy is particularly suitable in emerging fields such as the metaverse in education, where studies are still scarce, scattered, and heterogeneous regarding objectives,

methods, and contexts (Aibar, 2023).

The review was guided by three research questions that directed the studies' search, selection, and analysis:

1. How do empirical studies describe the experiences of students in educational environments mediated by the metaverse?
2. What pedagogical implications emerge from these student experiences?
3. What recommendations, good practices or challenges arise for the design of teaching strategies in these immersive environments?

To carry out this review, an exploratory narrative review approach was used, an ideal methodology when the objective is not to quantify effects or test hypotheses but to understand a complex phenomenon in a broad, contextualized, and critical way (Tomasina & Pisani, 2022; Roman-Acosta, 2024b). Unlike a traditional systematic review, which follows strict protocols for searching and synthesis, narrative review allows for integrating different methodological approaches (qualitative, quantitative, and mixed) and constructing an in-depth interpretation based on diverse sources. This strategy is particularly suitable in emerging fields such as the metaverse in education, where studies are still scarce, scattered, and heterogeneous regarding objectives, methods, and contexts (Aibar, 2023).

The review was guided by three research questions that directed the studies' search, selection, and analysis:

- purely theoretical or technical studies without student participation,
- articles focused exclusively on teachers or on platform development,
- research addressing immersive technologies (VR or AR) without integrating the concept or structure of the metaverse,
- and grey literature such as blogs, institutional notes, non-refereed reviews or documents without full access to the text.

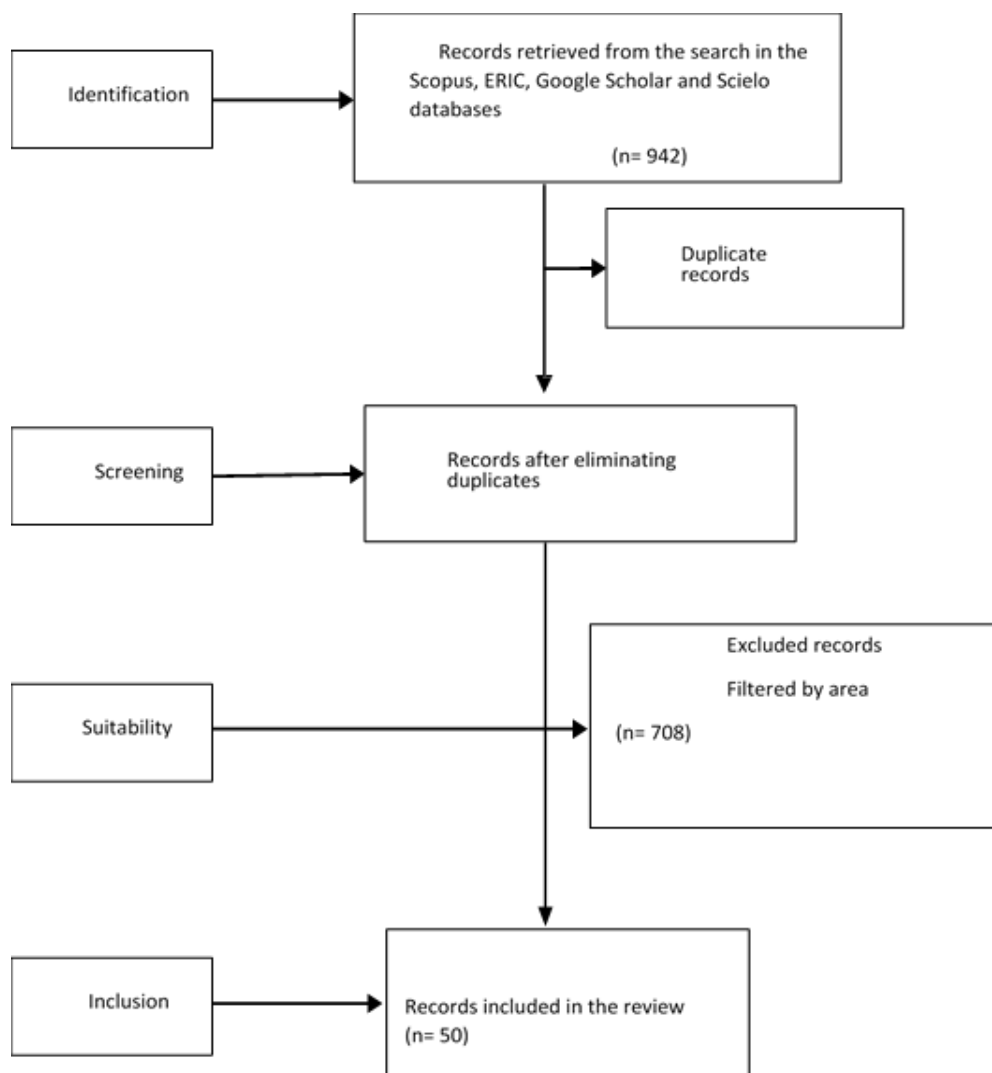


Figure 1. Data selection flowchart

For the analysis, a data extraction matrix was constructed that allowed for comparing and categorizing the findings according to key dimensions: type of study, educational level, country or region, methodology used, aspects of the student experience explored, and main pedagogical implications. The analytical approach was thematic and interpretive, which allowed for grouping findings into recurring patterns, challenges identified, and recommendations arising from the student experience.

It should be noted that a post-positivist perspective was adopted, which recognizes the coexistence of multiple realities around the educational phenomenon. This made it possible to approach the student experience in the metaverse not as a homogeneous fact but as a situated construction influenced by cultural, emotional, pedagogical, and technological factors.

RESULTS

The results of this narrative review were organized according to the three research questions posed, progressively addressing the experiences of the students, the pedagogical implications derived from those experiences and, finally, the recommendations and challenges for the design of teaching in educational metaverse environments.

Student experiences in the educational metaverse

The studies show that most students perceive the metaverse as a positive, innovative, and motivating experience. They highlight the possibility of interacting more freely, learning with greater autonomy, and feeling immersed in virtual environments that simulate real learning situations. Participation, enjoyment, and personalization are recurring dimensions in these experiences.

However, important nuances were also observed. Some students expressed difficulties adapting, concerns about their data privacy, visual and emotional fatigue, and feelings of disconnection when the experiences were not well guided by teachers or lacked a clear pedagogical purpose. In this sense, the reported experiences vary according to factors such as educational level, technology access, and discipline type.

The findings corresponding to this dimension are summarized in the table 1.

Table 1. Student experiences in the metaverse

Author (Year)	Methodology	Main conclusion
Rysulová (2024)	Qualitative	The metaverse increases student participation and personalizes the experience, although it faces barriers such as access and costs.
Varghese (2023)	Qualitative	The metaverse offers practical experiences without physical risk, improving understanding in areas such as medicine or engineering.
Özdemir et al. (2022)	Quantitative	Attitudes towards and knowledge of the metaverse vary according to students' socio-cultural and economic factors.
Liu et al. (2024)	Narrative review	The metaverse can improve the personalization of learning and increase student participation if safe and accessible environments are used.
Muthmainnah et al. (2023)	Quantitative	The use of the metaverse improves motivation and academic performance, mediated by student engagement.
Ktoridou et al. (2023)	Mixed	Students and teachers are open to the educational metaverse, although they have reservations about its large-scale implementation.
Rahman et al. (2023)	Qualitative	Students need teaching guidance and data protection to take advantage of the metaverse as an educational space.
Liu (2024)	Argumentative essay	The metaverse transforms education by enabling immersive experiences, global collaboration and personalized learning.
Almarzouqi et al. (2022)	Mixed (SEM-ML)	User satisfaction is key to the adoption of the metaverse by medical education students.
Mustafa (2022)	Mixed	The use of the metaverse must take into account student perceptions and technical support for effective integration.
Al-kfairy et al. (2022)	Qualitative	Students value the flexibility of the metaverse, but they fear distraction, privacy and digital health.
López-Belmonte et al. (2023)	Systematic review	The metaverse increases motivation and learning, although more studies are needed in diverse populations.
Arofah et al. (2023)	Quantitative	Although the metaverse encourages engagement, it can affect mental health due to the lack of physical interaction.
Prakash et al. (2023)	Review and analysis	The metaverse offers accessibility and educational flexibility, but requires digital skills and care with regard to privacy.
Talan & Kalinkara (2022)	Mixed	Students find that the metaverse motivates and makes the content more attractive, although it can be distracting and affect discipline.

Emerging pedagogical implications from the student experience

From the studies reviewed, various pedagogical implications emerge that reflect the potential of the metaverse as a transformative learning tool. There is a clear trend towards the promotion of active, collaborative and student-centered methodologies. Immersive platforms favor the development of skills such as autonomy, creativity, problem solving and intercultural awareness.

Likewise, the value of the metaverse in strengthening situated learning is emphasized, especially in linguistic, cultural or inclusive education contexts. However, these opportunities only materialize when the pedagogical design is intentional and aligned with educational objectives. When the technological component takes precedence over the pedagogical, the effects tend to be superficial or unsustainable.

Therefore, the pedagogical implications that emerge point to the need to rethink not only the tools, but also the practices, roles and educational purposes in virtual environments. The details are shown in table 2.

Table 2. Pedagogical implications of the metaverse

Author (Year)	Methodology	Main conclusion
Ghoulam & Bouikhalene (2024)	Qualitative	The metaverse transforms traditional pedagogical approaches, promoting a more collaborative and student-centered education.
Giri (2024)	Case study	Students design XR experiences and acquire creative, collaborative, and technical skills through immersive projects.
Hatmanto et al. (2023)	Qualitative	The metaverse enhances autonomy, intercultural competence, and motivation in English language learning.
Dewi (2024)	Qualitative	Learning in the metaverse promotes immersion, collaboration and cultural contextualization, strengthening language acquisition.
Nedeva & Duchevea (2024)	Critical review	Metaverse technologies favor active pedagogical approaches such as collaborative, reflective and project-based learning.
Batalla & Pedrero (2023)	Mixed	The metaverse favors student interaction, although many teachers lack the training to integrate it pedagogically.
Aleksić (2023)	Quantitative	Social learning in the metaverse improves academic results, highlighting the role of the pedagogical component over the technological one.
Figueiredo (2022)	Pedagogical essay	The metaverse offers embodied educational experiences that transform rhetoric and learning into humanities.
Rahman et al. (2023)	Systematic review	It is essential to train teachers in the design of collaborative and ethical classes within the metaverse to avoid misuse of data.
Porras et al. (2025)	Mixed	The metaverse motivates learning and fosters collaborative work among indigenous students in secondary education in Mexico.
Rysulová (2024)	Critical essay	The metaverse can democratize access to learning, although investment in infrastructure and inclusive policies are required.
Hashim et al. (2023)	Synthesis review	Immersive experiences in the metaverse foster creativity, collaboration, and the production of shared knowledge.
Mohsen et al. (2023)	Case study	The use of the metaverse in history helps develop heritage awareness and emotional learning in children.
Vanegas & Sánchez (2024)	Qualitative	The metaverse in business education improves interactivity, but requires innovative pedagogical design and overcoming technical barriers.
Pyae et al. (2023)	Quantitative	Metaverse platforms such as AIIS are promising, but usability and user-centered design need to be improved.

Recommendations and challenges for the design of teaching strategies

The third line of results focused on identifying recommendations, good practices and challenges for teachers who integrate the metaverse into their classes. First, it confirms that one of the main obstacles is the lack of specific teacher training, both in technical skills and in pedagogical competences related to instructional design in immersive environments.

In addition, the studies highlight the importance of designing student-centered experiences that incorporate elements such as gamification, artificial intelligence, accessibility, and meaningful assessment. Emphasis is also placed on the need for institutional policies that promote equity, access to infrastructure, and the protection of students' privacy and emotional well-being.

In this sense, for the metaverse to translate into a real improvement in learning, reflective, creative and collaborative teaching action is required, supported by ethical, methodological and technological frameworks. The key recommendations and challenges are presented in table 3.

Table 3. Recommendations and pedagogical challenges in the metaverse

Author (Year)	Methodology	Main conclusion
Shi et al. (2023)	Qualitative	They identify four key challenges for teachers: academic pressure, technical implementation, teacher training and digital ethics.
Rysulová (2024)	Critical review	They highlight the need for investment in infrastructure, equitable access and specific teacher training strategies.
Reis et al. (2023)	Integrative review	They emphasize that teacher training is still traditional, limiting the use of the metaverse.
Agrati (2023)	Mixed	They explore the role of NPC tutors in initial teacher training and how they affect pedagogical decisions.
Rane et al. (2024)	Case study	They propose design frameworks that prioritize personalization and artificial intelligence in teaching strategies.
Yu (2022)	Quantitative and experimental	They design a VR teacher training system; participants report high satisfaction and functionality.
Lin et al. (2022)	Systematic review	They suggest redesigning curricula and teaching strategies to integrate augmented reality, AI, and personalization.
Pradana & Elisa (2023)	Systematic review	More research is needed on teaching strategies and assessment tools for the metaverse.
Rahman et al. (2023)	Review	They recommend that teachers design collaborative classes and platforms that protect student privacy.
Darmawansah et al. (2024)	Case study	Teachers in training face different challenges depending on the level of immersion of the virtual environment.
Rodríguez-Flórida & Maynar (2024)	Review with practical guide	They offer applied recommendations for integrating the metaverse into medical education while avoiding technical barriers.
Villalonga-Gómez et al. (2023)	Systematic review	They underline the importance of interaction, student autonomy and didactic redesign.
García et al. (2023)	Exploratory study	They raise technical and ethical challenges perceived by teachers and students in the redesign of an educational metaverse.
López-Belmonte et al. (2023)	Systematic review	They highlight the need to design valid instruments to evaluate educational experiences in the metaverse.
Jusuf et al. (2023)	Applied research	The ADDIE model allowed for the design of attractive classes, but constant teacher training is required.
Prakash et al. (2023)	Theoretical review	They recommend alignment between pedagogical objectives, technology, and support for students and teachers.
Damasceno et al. (2023)	Rapid review	They raise the need for assistive technologies to guarantee inclusion and accessibility in metaverse environments.
Pahmi et al. (2023)	Qualitative case study	Teachers value the interactivity of the metaverse, but require technical and pedagogical training.
Camilleri (2023)	Critical review	Suggest regulatory guidelines for teachers on ethics, privacy and mental health in the use of the metaverse.
Damaševičius & Sidekėrsniene (2023)	Case study	Show how gamified strategies improve student engagement if they are well designed by teachers.

DISCUSSION

The results visualize a broad and diverse set of recommendations, good practices, and challenges teachers face when integrating the metaverse as a pedagogical tool.

1. How do empirical studies describe students' experiences in educational environments mediated by the metaverse?

The studies reviewed offer us a vibrant and varied picture of how students experience their time in the metaverse. There is a positive feeling regarding motivation, participation, and the possibility of more immersive and meaningful learning.

The findings of this narrative review reveal that student experiences in the educational metaverse are complex, diverse, and deeply rooted in personal, cultural, and technological factors. The studies generally show a predominantly positive perception, especially about the motivation, interest, and immersion that virtual environments generate. For example, authors such as Muthmainnah et al. (2023) found that using the metaverse enhances students' intrinsic motivation, translating into improved academic performance. Similarly,

Liu (2024) and López-Belmonte et al. (2023) agree that these platforms enable more dynamic, engaging, and personalized learning.

However, along with these benefits, tensions, and concerns also emerge that temper the initial enthusiasm. Several studies warn of risks of distraction, disconnection from the real world, digital fatigue, and privacy concerns (Talan & Kalinkara, 2022; Al-fairy et al., 2022; Arofah et al., 2023). These concerns not only affect the level of student engagement but also invite critical thinking about the limits of the metaverse as a learning environment. While some students value flexibility and immersive interaction, others doubt the sustainability of these experiences over time, especially in contexts where resources are limited or digital skills are uneven (Rahman et al., 2023; Özdemir et al., 2022).

Another important finding is the variability in student perceptions according to educational level, sociocultural context, and access to technology. For example, in technologically advantaged university environments, as observed in the study by Almarzouqi et al. (2022), students express greater openness, satisfaction, and willingness to integrate the metaverse into their education. In contrast, in less favorable contexts or with students with no previous experience, the metaverse can be perceived as an alien or intimidating tool, generating resistance or apathy (Mustafa, 2022; Varghese, 2023).

From a pedagogical perspective, the student experience in the metaverse is mediated by the quality of instructional design and teacher support. The research reviewed insists that it is not enough to transfer content to the 3D environment; it is necessary to rethink educational dynamics, forms of assessment, community building, and emotional and technical support for students (Ktoridou et al., 2023; Rysulová, 2024).

The most interesting thing is that most studies agree that the metaverse has excellent potential, but that potential depends on how it is used. When there is careful pedagogical design, with well-thought-out activities and actively accompanying teachers, students enjoy it more and learn better (Ktoridou et al., 2023; Rysulová, 2024). On the contrary, when it is left to the technical or the spectacular, there is a risk of losing the educational focus.

2. What pedagogical implications emerge from student experiences in the educational metaverse?

One of the most apparent conclusions of this review is that the metaverse is inviting us to rethink pedagogy from the ground up. Immersive environments offer new tools and demand new ways of teaching and learning. Firstly, a change of focus towards active methodologies is highlighted, where the student takes a leading role in their learning process. Immersive platforms allow for scenarios where students explore, create, and collaborate, which favors autonomy, critical thinking, and meaningful learning (Ghoulam & Bouikhalene, 2024; Hatmanto et al., 2023).

Likewise, many studies agree on the need for teachers to design new pedagogical strategies adapted to the virtual environment, focused on interaction, problem-solving, and project-based learning. This is evidenced in works such as that of Dewi (2024) and Giri (2024), where the experiences of digital co-design and co-creation were highly motivating and enriching for student learning. The metaverse, then, is not just a visually appealing environment but a space that requires the redesign of educational dynamics to make them more participatory, horizontal, and context-sensitive.

A key implication is considering interculturality, language, and local context as part of pedagogical design. For example, in the case of indigenous populations in Mexico (Porrás et al., 2025), the metaverse made it possible to reinforce collaborative learning from a culturally situated perspective, showing that these environments can be powerful tools for inclusion if developed with sensitivity. Similarly, studies in English language teaching (Hatmanto et al., 2023) highlight its contribution to developing intercultural competence and autonomous learning.

However, significant challenges also emerge. One of the most recurrent is the lack of specific teacher training to design compelling educational experiences in the metaverse. Although the enthusiasm of many teachers is recognized, studies such as that of Batalla and Pedrero (2023) show that many of them continue to use traditional approaches in virtual environments, which reduces the pedagogical potential of these tools. Furthermore, the absence of clear pedagogical criteria for integrating these technologies limits their scope (Rahman et al., 2023; Rysulová, 2024).

Another central aspect is the importance of user experience (UX) and student-centered design. Research such as Pyae et al. (2023) shows that while the metaverse has high educational potential, this only materializes when environments are accessible, understandable, and emotionally safe for students. This requires a pedagogy that considers not only content but also the emotional, ethical, and social dimensions of digital learning.

Finally, immersive experiences allow the incorporation of aesthetic, heritage, and sensory dimensions previously challenging to explore in the classroom. Studies such as Mohsen et al. (2023) show how the metaverse can develop historical, affective, and civic awareness in contexts such as history teaching or urban planning. This shows that its pedagogical contribution goes beyond the technical and can contribute to a more human, situated, and emotionally meaningful education.

In short, the metaverse can be an opportunity to renew pedagogy as long as it is understood as a means to enrich learning and not as an end in itself.

3. What recommendations, best practices, or challenges arise when designing teaching strategies in immersive educational environments such as the metaverse?

When reviewing the most recent research, it is clear that designing teaching strategies for the metaverse is not simple. The challenges are varied, ranging from technical and infrastructure issues to training, ethical, and emotional barriers.

Firstly, the studies agree that the most significant current challenge is the lack of teacher training in designing immersive educational experiences. Many educators still rely on traditional strategies, which limits the metaverse's transformative potential (Reis et al., 2023; Villalonga-Gómez et al., 2023). This shortcoming is not only technical but also pedagogical: training is needed to rethink the role of the teacher, learning objectives, and active methodologies in these new environments.

In response to this situation, several studies propose concrete recommendations for teacher training. Some of them point to the development of training platforms with virtual reality (Yu, 2022), while others suggest that training programs should include competencies in digital ethics, data protection, inclusion, and adapted instructional design (Shi et al., 2023; Rahman et al., 2023; Camilleri, 2023). The usefulness of gamified instructional design (Damaševičius & Sidekersniene, 2023) or the co-creation of experiences between teachers and students (Garcia et al., 2023) is also recognized.

Another salient point is the need to intentionally and reflectively align pedagogical design with technology. It is not a question of using the metaverse for novelty's sake but ensuring that technological decisions respond to clear educational objectives. To this end, it is suggested to use student-centered design frameworks that incorporate personalization, feedback, gamification, and collaboration in safe environments (Rane et al., 2024; Prakash et al., 2023). The importance of designing with purpose is reaffirmed in studies applied in medical education (Rodríguez-Florido & Maynar, 2024) and secondary education (Jusuf et al., 2023), where detailed planning allowed for greater motivation, autonomy, and task fulfillment on the part of the students.

However, structural barriers persist even when there is a willingness on the part of teachers and sound pedagogical designs. These include the high costs of implementation, unequal access to devices, the teacher-student digital divide, and the ethical dilemmas associated with using personal data in immersive environments (Rysulová, 2024; Damasceno et al., 2023). These difficulties force us to rethink training and the institutional policies and regulatory frameworks that guarantee an ethical, safe, and inclusive use of the metaverse (Camilleri, 2023).

Finally, it is worth noting that some proposals aim to design evaluation strategies adapted to the immersive environment and to develop valid and reliable instruments to assess the quality of the educational experience in the metaverse (López-Belmonte et al., 2023). This is especially relevant in a field where exploratory studies still predominate and more robust evidence is required to guide teaching practice with greater certainty.

In short, for the metaverse to contribute to education, creativity, training, institutional support, and a critical eye are needed. Only in this way will it be possible to transform difficulties into real opportunities to teach and learn in more humane, inclusive, and meaningful ways.

CONCLUSIONS

The metaverse has burst into the educational sphere as a technology capable of transforming learning environments. Its capacity to generate immersive experiences is driving new ways of teaching and learning. However, despite its growing implementation, there is still a gap in the in-depth understanding of how students experience these virtual experiences and what pedagogical implications arise from them.

This article aimed to analyze, through a narrative review and with an exploratory approach, the pedagogical implications derived from empirical studies on student experiences in educational environments mediated by the metaverse. To this end, 50 original studies published between 2022 and 2024 in English and Spanish that used qualitative, quantitative, and mixed methodologies were reviewed. The review was organized around three research questions.

The findings show that the metaverse can increase student motivation, participation, and collaboration, but it also presents technical, emotional, and pedagogical challenges that affect its implementation. It is concluded that its effective incorporation into education requires a pedagogical redesign, specific teacher training, digital inclusion policies, and a student-centered ethical perspective.

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