12th International Conference of the Immersive Learning Research Network
Selected Academic papers for the iLRN Proceedings
DOI: https://doi.org/10.56198/S7USILN1J

Immersion From The Onlife Education Perspective: The Cave Project

Aline Patrícia Sobral dos Santos[1] [0000-0002-7065-6959], Ires Cristina Souza Teixeira[1] [0009-0006-1272-4307] , Izabela Soares de Souza[1] [0009-0008-2544-689X], Andrey Guilherme Mendes de Souza[1] [0009-0002-3005-3798], Emanuel Victor de Assis e Azevedo[1] [0009-0008-8436-1626], Hemilly Araújo Costa[1] [0000-0002-5135-7726] and Fábia Magali Santos Vieira[1] [0000-0001-9497-5789]

[1] State University of Montes Claros, Montes Claros, Brazil
aline.filo.edu@gmail.com

Abstract. We live in a paradoxical era in which the expansion of digital connectivity coexists with the operation of algorithms that modulate attention, shape perceptions, and capture data on a large scale. The aim of this full article is to investigate the formative potential of an immersive learning experience in Virtual Reality, currently under development, conceived as a narrative game in the escape room format and grounded in Plato's Allegory of the Cave, to foster epistemological shifts, strengthen agency, and promote critical reflection among high school students regarding algorithmic mediation in the onlife condition. Based on a critical review of surveillance capitalism, data colonialism, and Onlife education, the article describes the design of the game "Cave Project*"*, articulating its narrative and mechanics with the adopted theoretical framework, within the scope of an intervention-oriented qualitative research approach. In doing so, the study seeks to contribute to the development of young people's critical awareness of the regimes of visibility and algorithmic mediation that permeate connected life.

Keywords: Virtual Reality, Social Networks, Immersive Education, Philosophy of Technology.

1 Introduction

Digital platforms have become the main stage for social, professional, and educational interaction. The promise of unlimited access to information coexists with the reality of algorithms that personalize content, direct our attention, and often reinforce informational bubbles. Studies such as that of Matos and Godinho [1] suggest that, in Brazil, there is a significant correlation between intensive use of social media and the increase in indicators of mental distress, although direct causality remains the subject of academic debate. The authors [1] point out that digital dependence affects social relationships and is associated with an increase in depressive symptoms among young people.

This finding directly resonates with the analyses of Haidt [2] in *The Anxious Generation*. The author argues that the massive introduction of smartphones and social media into the daily lives of young people from 2010 onwards has been associated in the literature with a "silent earthquake" in adolescent psychological development. Haidt [2] demonstrates that factors such as attention fragmentation, constant exposure to social comparison, and the logic of immediate rewards embedded in digital platforms contribute to the exponential growth of diagnoses of anxiety, depression, and self-harm at increasingly younger ages. According to Haidt [2], digitalized adolescence generates a type of hypervigilant subjectivity, shaped by likes, algorithms, and instant validation, which can weaken interpersonal bonds and inhibit emotional maturation.

For Souza and Cunha [3], this "virtual showcase," in which "ideal" bodies and lives are displayed, fosters comparisons and feelings of inadequacy. In parallel, more recent research on digital anxiety (Felippe and Michelon [4]) indicates that feelings such as anxiety, anguish, and loneliness are intensified both by continuous exposure to idealized life standards and by the pressure for validation (likes and followers). In addition to these factors, the fear of "missing out," known as Fear of Missing Out (FOMO), can further aggravate such negative feelings, especially among younger users.

It is thus evident how algorithms and constant notifications contribute to a permanent state of alertness, potentially increasing and/or intensifying digital dependence. Moreover, neurophysiological studies indicate that

social media algorithms are designed to maximize time spent on platforms by capturing behavioral data to model preferences and activate neuronal reward mechanisms, in a manner analogous to chemical addiction (Debasmita et al. [5]).

This scenario, permeated by the premise of capturing our attention, places subjects' autonomy at risk. By operating under a logic of personalization, algorithms restrict the individual's horizon of choices, confining them to informational flows that merely reinforce preexisting inclinations. This invisible "choice architecture" compromises self-determination, as the subject becomes less reflective and more inattentive. This article aims to investigate the formative potential of an immersive learning experience in Virtual Reality, currently under development, conceived as a narrative game in the escape room format and grounded in Plato's Allegory of the Cave, to foster epistemological shifts, strengthen agency, and promote critical reflection among high school students regarding algorithmic mediation in the onlife condition.

By highlighting the influence of algorithmic systems on the construction of truth and the formation of subjectivity, we draw on Plato's Allegory of the Cave as an interpretative lens to denaturalize the contemporary "prison of shadows" through the digital realm. This metaphor allows for a critical exploration of the social construction of ignorance, contemporary mechanisms of symbolic domination, and possibilities for emancipation. In this sense, we propose rethinking the prisoner's journey within a virtual game, in which students are invited to experience and reflect upon algorithmic mediations—common to many users—that permeate their digital everyday lives.

It should be emphasized that this work does not present empirical data regarding the "Project Cave" experience, as it constitutes an ongoing study of a qualitative and applied nature, inspired by action research and articulated with netnography (Kozinets [6]). Action research is understood in this study as a cyclical and reflective investigative process, in which planning, action, observation, and re-signification continuously feed back into one another. Thus, the design of the game, its initial experimentation, and the analysis of participants' responses constitute interdependent movements, guided by systematic attention to the pedagogical, epistemological, and affective effects produced by the immersive experience.

While action research sustains the interventionist and formative dimension of the proposal—seeking to align theory and practice through actions aimed at transforming a given reality—netnography, according to Kozinets [6], offers possibilities for understanding the sociotechnical and symbolic dynamics that emerge throughout the process. The methodology of action research does not follow linear stages but is organized around relevant situations that arise from the interactive process, unfolding in a circular movement that involves diagnosing the situation, planning, action, reflection, re-signification, and, when necessary, replanning.

As Pereira [7] points out, the formative and emancipatory nature of education enables subjects to become aware of the transformations occurring within themselves and throughout the educational process as a whole. This awareness fosters epistemological and ontological shifts among those involved. In other words, education provides possibilities for discerning fact from fiction, as well as stimuli for changing how individuals understand knowledge (epistemology) and themselves as agents in the world (ontology). In the "Project Cave," these shifts will be recognized through participants' ability to identify the "shadows" and algorithmic filters.

2 Theoretical Framework

2.1 The Allegory of the Cave and the Algorithmic Capture of Attention

Plato's Allegory of the Cave recounts the story of prisoners who take the shadows projected on a wall as reality, ignoring their true origin. When freed, this event becomes a symbol of rupture with ignorance. In our adaptation, students assume the role of the prisoners, while the shadows represent information filtered by algorithms. The cave is presented as a digital ecosystem in which reality is perceived through algorithmic windows. Byung-Chul Han [8] raises critical concerns about this information society, which is characterized not by freedom, but by the intensification of control and surveillance. According to the author, the excess of information dissolves interiority, producing subjects exhausted by the imperative of constant connectivity.

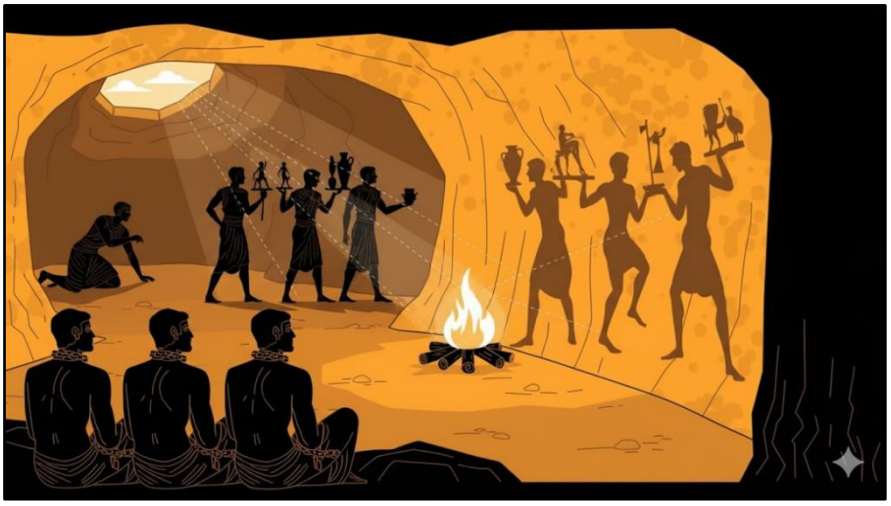

Fig. 1. The Allegory of the Cave. Image generated in Gemini1 (2025).

In this regime, being free no longer means acting, but rather clicking, liking, and posting, which significantly reduces the possibility of resistance. Attention is converted into capital, and experience into data. Domination does not occur through repression, but through seduction and self-exploitation, in which the subject, believing themselves to be free, becomes complicit in the logic that shapes their desires. Such data expropriation is conceptualized by Zuboff [9] as *surveillance capitalism* and by Mejías and Couldry [10] as *data colonialism*. Mejías and Couldry [10] argue that systems designed to optimize user retention time on digital platforms and to appropriate data are not merely a metaphor when compared to historical colonialism, but rather constitute a new era of coloniality focused on extraction and exploitation, imposing a singular reading of the world and reinforcing inequalities.

2.2 The Onlife Condition

Luciano Floridi [11] argues that the distinction between "online" and "offline" has lost its meaning, proposing the concept of *Onlife*[2] to describe a hyperconnected reality. Under this condition, the digital and the material merge, enabling every experience to be mediated by informational infrastructures.

"We live in times of the algorithmization of the world. This challenges us, within the educational field, to understand the transversality and interdisciplinarity of computational thinking in becomings, problematizations, and networked processes that transcend the human, producing connections in constant motion, detached from centralities and from dualisms such as subject–object, subject–technology, and subject–environment" [12].

Within the OnLIFE[3] Education Paradigm (Schlemmer and Moreira [13]), learning processes are not confined to dissociated physical or virtual spaces, but are constituted within hybrid and hyperconnected ecosystems, in which algorithms act as environmental forces [11], filtering information, modulating behaviors, and interfering with emotions.

In light of this distinctive context, educating *Onlife* means understanding the inseparability between life and connectivity: *On*, connected, and *Life*, life; recognizing that teaching and learning are configured as transorganic connective acts [14] and Di Felice [15], within a network of relationships among concepts, methodologies, and

[1] Prompt: Create a detailed illustration of Plato's Allegory of the Cave in the style of ancient Greek ceramic art. In the foreground, three chained prisoners are seated with their backs turned, shown in silhouette, staring fixedly at the wall of a cave. At the center, a bright fire casts shadows onto the wall. Between the fire and the prisoners, people walk along a raised ledge, holding various objects such as vases and statuettes, which create the shadows seen by the prisoners. In the background, one prisoner has escaped and is crawling toward the cave's exit, from which sunlight enters in radiant beams. The color palette is limited to black, orange, and yellow, creating strong contrast and a dramatic atmosphere.

[2] The term *onlife*, proposed by [11], refers to the contemporary human condition, characterized by the ubiquitous presence of digital technologies and networked connectivity, in which the distinction between being online or offline is blurred.

[3] While *OnLIFE* is a term used by Moreira and Schlemmer [14] to designate an educational paradigm that acknowledges the onlife condition—the inseparability of the online and offline dimensions of human experience—and guides a conception of education articulated with life.

practices that emerge from reticular and connective epistemologies. Exiting the "algorithmic cave," therefore, does not imply denying algorithms, but rather developing critical awareness of their mechanisms of modulation and of the ways in which they structure Onlife existence, opening space for the invention of new connective–ecological–ecosystemic pedagogies that enable inhabiting this reality while problematizing its implications for human formation.

Leaving the "algorithmic cave," therefore, does not imply denying algorithms, but rather developing critical awareness of their mechanisms of modulation and of the ways in which they structure Onlife existence, opening space for the invention of new connective–ecological–ecosystemic pedagogies that enable inhabiting this reality while critically problematizing its implications for human formation.

2.3 Immersive Learning Environments in Education

According to Morgado [16], immersive learning environments are spaces in which learning and immersion coexist. For Mystakidis and Lympouridis [17], immersion is a concept grounded in the metaphor of something being placed in three dimensions: system, narrative, and agency. System-based immersion refers to the subjective sensation of being surrounded by an environment—whether real, virtual, or perceived—while narrative immersion focuses on absorption in the meaning of the context, often generated through storytelling. This differs from immersion through agency, which relates to absorption arising from opportunities for engagement within the context, either through self-initiated actions or in response to emerging challenges. All these dimensions are influenced by technology, as well as by human and non-human factors. [16] argues that immersion is not merely an intrinsic feature of environments, but rather a theoretical lens for interpreting and analyzing the learning processes that take place within them.

Virtual Reality (VR), for example, is an advanced interface technology that allows users to immerse themselves, interact, and engage within a computer-generated three-dimensional environment (Tori et al. [18]). According to Tori et al. [18], VR is grounded in three pillars: immersion, which promotes a sense of presence in the virtual environment by sensorially isolating the user from the real world; interaction, which enables users to manipulate virtual objects and elements in real time; and involvement, which refers to the degree of cognitive and emotional engagement with the experience. It is the conjunction of these factors that underpins the educational potential of VR, as it enables the creation and orchestration of simulations that enhance knowledge retention and foster meaningful learning among students.

Recent literature reviews on the use of virtual reality in education provide consistent evidence that immersive experiences can enhance engagement, motivation, and conceptual understanding, particularly when aligned with clear pedagogical objectives and grounded instructional design (Pereira and Laiola [19]; Liu et al. [20]). These studies emphasize that the effectiveness of VR does not lie solely in the degree of technological immersion, but in how presence, interaction, and cognitive load are balanced in the experience design, thereby avoiding overload and supporting meaningful knowledge construction.

It is also important to emphasize that VR transcends a purely technical definition. From the perspective of Pierre Lévy [21], technology should be understood as a driver of virtualization. For the philosopher, the virtual does not stand in opposition to the real, but rather to the actual. The virtual thus constitutes a complex of forces and tendencies that call for resolution and actualization. In this sense, VR does not create a "false reality," but instead actualizes a set of potential experiences and scenarios. It represents a process of becoming—a passage from the actual to the virtual—that results in the reconfiguration of perception and knowledge (Lévy [21], p. 17). Accordingly, VR can be understood as virtualizing human experience itself, opening a problematic field that requires participants to invent new responses and construct new meanings.

It is at the intersection of these two perspectives that the pedagogical power of our research resides. Virtual games, when integrated with VR, employ immersion and interaction (Tori et al. [18]) to materialize a process of problematization [21]. In our study, the traversal of the cave is simulated through a VR game that combines the immersive potential of the technology with gamification.

Damianova and Berrezueta [22] demonstrate in their study that the use of serious games integrating VR with high school students promotes motivation and interest in the immersive experience, as it fosters active participation that traditional methods often fail to achieve. The authors further highlight that employing everyday-life scenarios for learning and experimentation leads to a deeper understanding of pedagogical content.

The design of the "Project Cave" directly engages with pedagogical principles well established in the literature. Experiential learning (Kolb [23]) is manifested through the action–reflection cycle promoted by the game's challenges, while situated learning (Almeida [24]) is operationalized through a narrative environment that simulates practices and dilemmas drawn from students' digital everyday lives. Gamification, in turn, is employed

as a support for agency, enabling players' choices to influence narrative development and multiple endings, in line with studies that identify agency as a central element of meaningful immersive experiences (Mystakidis and Lympouridis [17]). The "Project Cave" proposal goes beyond simulating a situation; it transports a philosophical dilemma into the virtual domain, inviting players to undertake a traversal conducive to epistemological and ontological shifts.

3 Methodology: Immersive Netnography with the "Cave Project"

The "Project Cave" adopts a qualitative, applied, and intervention-oriented approach, structured around action research (Koerich et al. [25]) and complemented by netnography [6], configuring a methodological design consistent with investigations in immersive education. Action research sustains the formative character of the project by articulating the conception, implementation, and critical reflection on the Virtual Reality (VR) intervention, organized in a circular movement that involves diagnosis, planning, action, analytical observation, and replanning, when necessary. With regard to netnography, it seeks to understand the sociotechnical dynamics that emerge from the immersive experience and extend into everyday digital interaction environments. Inspired by [6], netnography will be developed through the systematic monitoring of participants' interactions in mediated digital spaces, specifically instant messaging groups created for the study, in which students will be able to share impressions, reflections, questions, and interpretations related to the Virtual Reality game experience.

This project is still in its development phase; therefore, to date, no empirical data or results from the immersive experience have been collected. To illustrate the proposed educational environment, readers are invited to access the game trailer via the provided link[4]. Through the video, it is possible to visualize the Narrator, personified by Plato, who functions as the player's guide throughout a learning journey.

3.1 Participants and Procedures

The study will be conducted in Brazilian public secondary schools located in urban contexts and affiliated with state education systems. The choice of this context is justified by the widespread presence of young people immersed in the Onlife condition, as well as by the relevance of promoting formative experiences within public school settings that critically problematize the use of digital technologies. The participants will be students aged between 15 and 18 years, enrolled in classes that are beginning or currently undertaking curricular components related to Philosophy or related fields.

The recruitment process will take place through institutional coordination with the participating schools, followed by an invitation to interested students, in accordance with voluntary participation criteria. Participation will be conditional upon formal authorization from the school institution, informed consent from legal guardians, and assent from the students themselves. The proposed sample is intentional and qualitative in nature, with an estimated participation of approximately 15 to 25 students, a number considered appropriate to ensure analytical depth.

3.2 Instruments and Procedures

The Game Design Document (GDD) of the *Cave Project* serves as a guiding framework for the development team, outlining all aspects of the game, from its conceptual vision to implementation details. It establishes the premise of a narrative suspense experience with educational elements, to be developed using the Godot 4.5 game engine for PC and Virtual Reality platforms. The GDD specifies gameplay mechanics such as the exploration of a claustrophobic environment, object interaction, the resolution of observation-based puzzles, and narrative progression through a time-passage system and predefined events. In addition, the document defines the art and sound direction to support a three-act story structure, as well as a multiple-ending system that varies according to player choices, ensuring that both the immersive experience and the proposed philosophical reflection remain coherent throughout the entire project.

The research will follow the following stages: (I) administration of a questionnaire to map participants' habits regarding immersive technologies and their perceptions of algorithms; (II) participation in individual gameplay sessions lasting approximately 15 minutes, structured into three acts and conducted using virtual reality headsets. It should be noted that, following prior consent formally documented, the sessions will be recorded for interaction

[4] Access link to the presentation video of the "Cave Project": https://www.youtube.com/shorts/AlGsmEgPj5Y

analysis; (III) post-experience interviews aimed at deepening participants' perceptions and insights, relating the game experience to their everyday Onlife context.

Each student will use the equipment in individual sessions or in small groups. During interaction with the material, data will be collected through audio and video recordings (with consent) in order to observe reactions, dialogues, and choices. In order to enhance this data collection—particularly with regard to alignment with the Onlife condition and netnography as proposed [6]—participants will be invited to join a WhatsApp group. This interactive space may enable, for example, the capture of screenshots of idea exchanges that support collective knowledge construction. Such materials will be analyzed as expressions of the participants' Onlife experience, allowing for an understanding of how the meanings attributed to the immersive experience are extended, transformed, or come into tension within students' digital everyday lives.

Throughout these processes, the researchers' attention will focus on indicators such as students' ability to recognize algorithmic filters, question the origin of presented information, establish connections with their digital routines, and demonstrate emerging forms of critical agency. These elements will serve as criteria for pedagogical and design-related decision-making, guiding possible modifications to the narrative, gameplay mechanics, and mediation strategies, without compromising the theoretical coherence of the proposal. In this way, action research is configured as a rigorous process of monitoring and conscious transformation of the intervention.

3.3 Ethics and Accessibility Considerations

The project will adhere to ethical standards for research involving human participants, ensuring informed consent, anonymity, and the right to withdraw at any time. The virtual reality experience will be adapted to prevent physical discomfort; such adaptations will include limiting usage time and organizing scheduled breaks between activities.

4 The Immersive Traversal: Articulating Theory and Practice

The proposed experience is conceived as a metaphor of Plato's *Allegory of the Cave*, in which students are invited to awaken in a digital room (see Fig. 2), illuminated solely by the light of a computer screen. As part of this immersive setting, students will encounter fragments of information—such as news items, images, and videos—projected onto the wall, simulating the incessant flow of social media and fostering situated learning [24].

Fig. 2. Representative image of the room under development. Image generated using Gemini[5] (2025).

As they explore the environment, participants will encounter puzzles that challenge the completeness of what is perceived, the origin of recommendations, and the validity of the information presented. Each puzzle solved will open fissures of light, gradually guiding them toward an external space where multiple perspectives become accessible, thereby enabling experiential and gamified learning [23].

[5] **Prompt:** Small and realistic bedroom, with dim lighting and a somber atmosphere. The bed is messy, with wrinkled sheets and a crooked pillow. Next to it, a simple desk with a turned-on computer, emitting bluish light that illuminates part of the room. Bare and subtle walls, with some signs of disarray, such as clothes scattered or a chair out of place. Cinematic, realistic style, with a contrast between darkness and the cold light of the monitor.

Along this pathway, the gamified immersive narrative may stimulate epistemic curiosity and critical awareness, as discussed by Bonfim et al. [26]. The experience seeks to challenge uncritical attitudes toward algorithms, while demonstrating the didactic potential of virtual games and virtual reality to provoke philosophical and pedagogical insights. In this sense, the integration of theory—Platonian philosophy, algorithmic critique, and the OnLIFE education paradigm proposed by Schlemmer and Moreira [13]—and practice—immersive experience and problem-solving—constitutes the core of this project.

Based on the theoretical assumptions of this study, the updating of the *Allegory of the Cave* transposes its classical elements to the context of contemporary digital life within the Onlife condition. In this reinterpretation, as illustrated in Table 1 presented below, the Cave ceases to be merely a physical location and becomes the digital ecosystem itself. This is evidenced in the game by the Cave acquiring a dual meaning: simultaneously the claustrophobic room of the protagonist—serving as the physical starting point—and the digital ecosystem to which the character connects, thereby constituting an environment of algorithmic entrapment.

The Prisoners represent users of digital platforms, particularly young students, many of whom live immersed in this environment without necessarily questioning the reality presented to them. The Shadows projected onto the wall correspond to algorithmically filtered and personalized content, in which news and social media interactions may result in distorted representations that shape perceptions of reality. In the game, in direct metaphorical correspondence with Plato's myth, the process of liberation represents the development of critical awareness and algorithmic literacy, whereby the freed prisoner is the one who begins to perceive the distortion of their worldview and actively seeks emancipation, symbolized in the game by the objective of leaving the room. The Sunlight, in turn, represents truth and critical knowledge regarding mechanisms of control and surveillance. In this sense, the difficulty of leaving the cave may reflect the seduction and behavioral dependency fostered by digital platforms.

In order to systematize this conceptual updating, Table 1 presents a comparative synthesis between the elements of the *Allegory of the Cave* in its classical formulation and their reinterpretation within the context of the *Cave Project*, highlighting how the philosophical metaphor is transposed to the contemporary digital ecosystem.

Table 1. Comparative overview of the Allegory of the Cave for its update in the Cave Project. Prepared by the authors (2025).

Element of the Allegory	Classical Interpretation	Cave Project
The Cave	Represents the sensible world, appearances, a place of illusion and ignorance.	It is a hyperconnected environment where reality is mediated by commercial platforms. In the game, it is the claustrophobic, dark room that limits the player's perception to what is delivered or digitally accessed.
The Prisoners	Represent the majority of people who live in ignorance, trapped by biases and opinions, without questioning reality.	Students who are users of digital platforms are subjects immersed in the Onlife condition, whose attention is captured and experience converted into data. In the game, it is the unnamed, gender-neutral protagonist controlled by the player.
The Shadows	Represent appearances and distorted images of true reality.	These are news items, social media posts, advertisements, and personalized information that form "information bubbles." In the game, they appear as interactions on the computer (fake social network, emails, news) and misleading information received via messages.
The Freed Prisoner	Represents the philosopher, who seeks knowledge through reason and frees themselves from the illusions of the sensible world.	It is the student who, through the experience, develops critical awareness of digital manipulation. In the game, it is the player who reaches the "Liberating Ending,"

		choosing to leave the room to escape consumerism and monotony.
The Outer World	Represents the intelligible world, the world of ideas, where true knowledge resides.	It is not a physical place, but a state of consciousness that allows access to multiple perspectives beyond algorithmic bubbles. It is the capacity to discern control mechanisms and exercise agency.
The Sun	Represents truth, knowledge, and wisdom.	It is the understanding of the functioning of surveillance capitalism, data colonialism, and systems that modulate behavior.
The Difficulty Of Leaving The Cave	Represents the challenges of education and people's resistance to accepting new truths.	It refers to the difficulty of breaking the dopamine reward cycles created by algorithms and the cognitive effort required to question an environment designed to be comfortable and captivating.
Meaning Of The Allegory	A reflection on the nature of reality and knowledge, and an invitation to pursue truth through Philosophy.	It is an invitation to question algorithmic mediation in our lives, to problematize attention capture, and to use education as a means of emancipation against the manipulation of major technology corporations.

This systematization allows for an integrated visualization of how each element of the allegory is re-signified within the game, functioning both as an analytical tool and as pedagogical guidance for the immersive experience, thereby reinforcing the coherence between philosophical theory, game narrative, and the project's objectives.

4.1 Data Analysis

The data will be subjected to thematic content analysis, aiming to identify categories that reveal epistemological and ontological shifts, such as perceptions of digital entrapment, recognition of algorithmic mediations, the development of critical awareness, and the emergence of agency. This analysis will be articulated with a netnographic perspective, considering data produced in digital environments as situated sociotechnical practices, and integrated into the reflective movement of action research, in which analysis feeds back into the intervention process.

In order to contextualize this analysis, the study will make use of the VOSviewer software, which is employed for the construction and visualization of interactive maps based on bibliometric networks, serving to quantify and analyze scientific literature. To ensure methodological rigor, theoretical triangulation will also be adopted, articulating perspectives from the Philosophy of Technology, OnLIFE Education, and studies on educational virtual reality, together with the analysis of audio and video recordings from the immersive experience, interviews, and partial feedback provided to participants.

5 Final Considerations

This article has presented the theoretical and methodological foundations of the *Cave Project*, a proposal for an immersive educational experience in Virtual Reality that articulates philosophical narrative, gamification, and principles of Onlife Education in order to problematize algorithmic mediation in contemporary life. Anchored in Plato's *Allegory of the Cave*, the project seeks to explore the formative potential of immersive experiences as a means of fostering epistemological shifts and the development of critical awareness among secondary school students.

The game's design is grounded in consolidated assumptions of immersive learning, particularly the centrality of agency as a structuring element of meaningful experiences. By allowing players' choices to influence the unfolding of the narrative and lead to multiple possible endings, the *Cave Project* engages with studies that conceptualize agency as the capacity to perform meaningful actions and to perceive their consequences within the narrative environment—an aspect that is central to cognitive and formative engagement in digital contexts. In this

sense, gamification is employed not merely as a motivational strategy, but as a device that promotes autonomy, decision-making, and critical reflection, in alignment with experiential and situated learning approaches.

Although the study does not present finalized empirical results, as it is an ongoing investigation, it is possible to outline relevant potential impacts. Among these, the possibility stands out that immersive experiences may enhance students' engagement with philosophical content, foster the problematization of algorithmic mediation, and stimulate the perception of oneself as an agent subject within the Onlife condition. Furthermore, the game design process itself already constitutes a methodological contribution to the field of immersive education by articulating action research, netnography, and game design within a single investigative trajectory.

This study presents limitations that must be acknowledged. The absence of consolidated empirical data prevents generalizations and the strict evaluation of educational effects. In addition, the qualitative and exploratory nature of the proposal, as well as technical and institutional challenges related to access to Virtual Reality equipment in public schools and the need for teacher training to ensure appropriate mediation of such experiences, should be considered. These limitations, however, do not weaken the study; rather, they delimit its scope and point toward directions for future research.

As future developments, the continuation of the research foresees the pedagogical validation of the prototype through multifaceted data collection, including recordings of gameplay sessions, interviews, questionnaires, and netnographic analysis of interactions in digital environments. It is expected that this trajectory will enable a deeper understanding of how the articulation between agency, immersive narrative, and pedagogical foundations can contribute to critical and emancipatory educational practices within the context of immersive learning.

By situating the *Cave Project* at the intersection of Philosophy, Education, and immersive technologies, this article seeks to contribute to the field of immersive learning by demonstrating that the use of Virtual Reality in education gains meaning when guided by consistent pedagogical principles, by a design that fosters agency, and by a critical perspective on the sociotechnical conditions that permeate connected life.

Acknowledgments

We thank the Minas Gerais State Research Support Foundation (FAPEMIG) for the financial support that made this research possible. The funding provided was crucial for the development of the activities of the Digital Education Hub at the State University of Montes Claros (UNIMONTES) and the EDUCAR and LED projects, contributing to the advancement of research in education and digital technologies.

References

1. Matos, K.A., Godinho, M.O.D.: The influence of excessive social media use on adolescent mental health: an integrative review. Revista Foco 17(4), e4716 (2024). https://doi.org/10.54751/revistafoco.v17n4-035
2. Haidt, J.: *The Anxious Generation*. Penguin Press (2024).
3. Souza, K., Cunha, M.X.C.: Impacts of virtual social network use on adolescents' mental health: a systematic literature review. Education, Psychology and Interfaces 3(3), 204–217 (2019). https://doi.org/10.37444/issn-2594-5343.v3i3.156
4. Felippe, A.M., Michelon, L.J.: Digital anxiety: effects of excessive social media use on young people's mental health. Aracê 7(6), 32928–32941 (2025). https://doi.org/10.56238/arev7n6-223
5. Debasmita, El Jamal, M., Aydemir, E., Khera, A.: Social Media Algorithms and Teen Addiction: Neurophysiological Impact and Ethical Considerations. *Cureus*, 17 (1), e77145 (2025). https://doi.org/10.7759/cureus.77145
6. Kozinets, R. V.: *Netnography: Redefined*. London, UK: SAGE Publications (2015).
7. Pereira, A.: *Emancipatory education as a strategy to confront fake news and disinformation in schools* (Master's thesis). Centro Universitário Mais (UNIMAIS), Inhumas, Goiás, Brazil (2025).
8. Han, B.-C.: The Burnout Society. Vozes, Petrópolis (2017).
9. Zuboff, S.: *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. Intrínseca, Rio de Janeiro (2020).
10. Mejías, U.A., Couldry, N.: *The Costs of Connection: How Data Is Colonizing Human Life and Appropriating It for Capitalism*. Stanford University Press (2019).
11. Floridi, L.: *The Onlife Manifesto: Being Human in a Hyperconnected Era*. Cham, Switzerland: Springer (2015).
12. Menezes, J., Schlemmer, E., De Felice, M.: Educação OnLIFE e cidadania digital: o desenvolvimento do pensamento computacional na cidade em tempos de algoritmização do mundo. Educar em Revista 40, e88519 (2024).
13. Schlemmer, E., Moreira, J.A.M.: Expanding concepts toward the OnLIFE digital education paradigm. Revista Interacções 16(55), 103–122 (2020).
14. Moreira, J.A., Schlemmer, E.: Toward a new concept and paradigm of Onlife digital education. Revista UFG 20, e63438 (2020). https://doi.org/10.5216/revufg.v20.63438

15. Di Felice, M.: *Net-activism: From social action to connective act*. São Paulo, Brazil: Paulus (2018).
16. Morgado, L.: Immersive learning environments. Video Journal of Social and Human Research, 102–116 (2022).
17. Mystakidis, S., Lympouridis, V.: Immersive Learning. In: *Encyclopedia*, vol. 3, no. 2, pp. 396–405 (2023). https://doi.org/10.3390/ encyclopedia3020026
18. Tori, R., Hounsell, M.S., Kirner, C.: Virtual Reality. In: *Introduction to Virtual and Augmented Reality*, pp. 13–35. Editora SBC (2018).
19. Pereira, G. E. A., Loiola, F. F.: Realidade Virtual E Aumentada No Ensino Médio: Da Abstração Teórica À Aprendizagem Imersiva. Revista Tópicos, 3(28) (2025). https://doi.org/10.5281/zenodo.18111893
20. Liu, R., Wang, L., Lei, J., Wang, Q., Ren, Y.: Effects of a virtual reality–based immersive classroom on students' learning performance in science lessons. *Br. J. Educ. Technol.* 51(6), 2034–2049 (2020).
21. Lévy, P.: *What Is the Virtual?* Editora 34 (2011).
22. Damianova, N., Berrezueta-Guzman, S.: Virtual reality–supported serious games: A literature review. *IEEE Access*, 13, 38548–38561 (2025). https://doi.org/10.1109/ACCESS.2025.3544022
23. Kolb, D. A.: *Experiential learning: Experience as the source of learning and development* (2nd ed.). Upper Saddle River, NJ: Pearson Education / FT Press (2015).
24. Almeida, E.G.: Situated learning. Texto Livre: Linguagem e Tecnologia 7(1), 177–184 (2014).
25. Koerich, M.S., Backes, D.S., Sousa, F.G.M., Erdmann, A.L., Albuquerque, G.L.: Pesquisa-ação: ferramenta metodológica para a pesquisa qualitativa. Electronic Journal of Nursing 11(3), 47234 (2009).
26. Bonfim, C., Morgado, L., Pedrosa, D.: Methods for creating immersive narratives: a review of literature reviews. Novos Olhares 2, 205282 (2023).