Design and Evaluation of Media Literacy Games: A Systematic Literature Review

Franco Araujo Simões[1], **Emanuel Felipe Duarte**[1]

[1]Instituto de Computação – Universidade Estadual de Campinas (UNICAMP)
Campinas–SP, Brasil

franco.simoes@students.ic.unicamp.br, emanuel@ic.unicamp.br

Abstract. ***Introduction:*** *Media and Information Literacy is a crucial skill in an era of increasing misinformation and algorithmically-driven content curation.* ***Objective:*** *While games have been explored as educational tools, there remains a need to systematically analyze how these interventions are being designed and evaluated.* ***Methodology:*** *This paper presents a Systematic Literature Review on the design and evaluation of Media Literacy Games. We selected 35 out of 725 studies from Scopus and ACM Digital Library, published between 2019 and 2025.* ***Results:*** *We highlight recurring patterns in game design, including the prevalent use of inoculation theory, structured linear experiences, and a strong emphasis on fact-checking and credibility assessment skills. Additionally, the review identifies common pedagogical frameworks, learning objectives, and assessment methodologies. This review provides insights into dominant design choices, gaps in existing approaches, and discusses potential areas for innovation, such as non-deterministic game experiences.*
Keywords *media literacy education; serious games; human-centered design; game-based learning; digital literacy assessment.*

Resumo. ***Introdução:*** *O Letramento Midiático e Informacional é uma habilidade essencial em um cenário de crescente desinformação e curadoria algorítmica de conteúdo.* ***Objetivo:*** *Embora jogos já tenham sido explorados como ferramentas educacionais, ainda é necessário analisar sistematicamente como essas intervenções estão sendo concebidas e avaliadas.* ***Metodologia:*** *Este artigo apresenta uma Revisão Sistemática da Literatura sobre o design e a avaliação de jogos voltados ao Letramento Midiático. Foram selecionados 35 estudos, dentre 725 identificados nas bases Scopus e ACM Digital Library, publicados entre 2019 e 2025.* ***Resultados:*** *Destacamos padrões recorrentes no design de jogos, como o uso prevalente da teoria da inoculação, experiências lineares estruturadas e forte ênfase em habilidades de checagem de fatos e avaliação de credibilidade. A revisão também identifica estruturas pedagógicas, objetivos de aprendizagem e metodologias de avaliação comumente adotados. Esta revisão oferece uma visão sobre as principais escolhas de design, lacunas nas abordagens existentes e discute possíveis caminhos de inovação, como experiências de jogo não determinísticas.*
Palavras-Chave *alfabetização midiática; jogos sérios; design centrado no ser humano; aprendizagem baseada em jogos; avaliação da literacia digital.*

1. Introduction

The contemporary media and information landscape is characterized by an over-saturation and an ever-increasing decentralization in the production and dissemination of content. Although the use of digital media has expanded access to information – allowing individuals not only to find content online, but to also create and share their own – it has also challenged individuals' abilities to interpret and distinguish between reliable and manipulated content. While social media and the advancement of technologies such as Generative Artificial Intelligence (GenAI) have democratized content creation, they have not equally disseminated the skills required to navigate safely, critically assess, and verify information [Gregory 2023, Rosenberg 2023]. The spread of misinformation is thriving in such a scenario, leading to increased skepticism, polarization, and the erosion of trust in journalistic and scientific sources [Gregory 2023].

Developing competencies to evaluate information, verify sources, and understand the mechanisms of media creation and manipulation is essential for preparing individuals to navigate this complex information ecosystem [Gregory 2023, Rosenberg 2023]. In addition to the skills, an attitudinal change toward media is required: individuals need to understand the impact of information disorders on society and actively choose to participate ethically in this ecosystem [Buckingham 2006]. Media and Information Literacy (MIL) has emerged as an umbrella framework involving other pertinent literacies (such as digital literacy, news literacy, and others) to equip individuals with the ability to analyze, evaluate, and responsibly engage with digital content [UNESCO 2021, Dadakhonov 2024]. Organizations such as UNESCO [UNESCO 2021] have outlined key competencies and attitudes in MIL, including critical evaluation of sources and awareness of the underlying mechanisms behind the creation of different forms of media. Although MIL curricula (such as UNESCO's) have well-defined learning outcomes and recommended activities, the widespread adoption still faces challenges: traditional approaches – such as lectures and static educational materials – fail to engage participants [Bulger e Davison 2018, Contreras-Espinosa e Eguia-Gomez 2023]. Game-based Learning has been increasingly explored as a means to address this issue [Contreras-Espinosa e Eguia-Gomez 2023, Molnar e Kostkova 2013, Glas et al. 2023].

Digital games have the potential to create interactive environments and simulate real scenarios, prompting users to actively participate in real-life situations and processes without risks of bad consequences for mistakes. Media Literacy Games [Glas et al. 2023], for example, may allow players to interact with the process of information creation and propagation by offering experiential learning environments that mirror real-world media consumption. However, while media literacy games have been explored as tools for fostering critical thinking and digital literacy, there remains a need to systematically analyze how their design strategies integrate theoretical frameworks, media literacy definitions, and learning objectives into cohesive educational experiences.

This paper presents a systematic literature review focusing on academic research in game-based media literacy education. The review examines studies with games designed to combat misinformation in terms of addressed literacies, game mechanics, learning approaches, design strategies, demographics, and evaluation strategies. The main contributions of this review are an in-depth overview of the landscape of game-based media literacy education research, and original design considerations to be taken

into account in the design of such games.

The remainder of this paper is structured as follows: in Section 2 we detail the methodology employed in the systematic literature review, including research questions, search strategies, inclusion/exclusion criteria, and data analysis techniques; in Section 3 we present the selected works and an overview of their characteristics according to our research questions; in Section 4 we discuss our findings and their implications as design considerations. Lastly, in Section 5 we present our main conclusions and directions for future work.

2. Methodology

The main objective of this systematic literature review is to identify and analyze academic research describing the process of design and evaluation of Media Literacy Games. As specific objectives, we aim at answering the following Research Questions (RQ):

> **RQ1**: What kind of specific literacies, and respective references, are being addressed in Media Literacy Games?
> **RQ2**: What design strategies are employed in Media Literacy Games, and how are they aligned with or derived from the educational frameworks used to achieve their learning objectives?
> **RQ3**: Are Media Literacy Games incorporating accessibility measures and design adaptations to cater to diverse audiences?
> **RQ4**: How are Media Literacy Games being evaluated in terms of objectives, methodologies, and metrics?

2.1. Search Strategy

The search was conducted on November 2024, and we processed the results with a protocol based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [Moher et al. 2009]. To systematically retrieve relevant academic studies, we formulated a broad search query to ensure comprehensive coverage of research related to our key topics. This query was structured around three primary concepts: *1) Games*, with the term "game" being included to capture a wide range of works, encompassing educational games, digital games, board games, and also articles related to game design and development research; *2) Literacies*, with the term "literacy" being included to encompass studies on media literacy, digital literacy, information literacy, and related concepts; and *3) Information Manipulation Qualifiers*, with incorporated keywords related to misinformation, such as "fake news", "deepfakes", "disinformation", and "misinformation", to ensure the retrieval of studies specifically addressing games as tools for critical engagement with manipulated information. Thus, the formulated query was:

```
game AND literacy AND (disinformation OR misinformation
OR "fake news" OR deepfake)
```

We conducted the searches in two major academic databases known for their extensive coverage of computer science, digital media, and education research: Scopus[1]

[1] https://www.scopus.com/

and ACM Digital Library[2]. A search was also performed in the Brazilian SBC/SOL Digital Library[3], but no results were found. For Scopus, the query was applied to the Title, Abstract, and Keywords fields to maximize relevant results while avoiding excessive noise from full-text searches, resulting in 59 studies. For ACM Digital Library, we found no reliable option to filter results strictly by Title, Abstract, and Keywords; therefore, we performed a full-text search – acknowledging that the filtering process would be conducted manually in subsequent steps – resulting in 666 studies. In sum, 725 studies were retrieved in this first step.

2.2. Inclusion and Exclusion of Studies

The flow diagram of Figure 1 illustrates our search and selection of documents. To filter the results, we defined the Exclusion Criteria (EC) as listed in Table 1. EC1 filters out duplicate entries. EC2 and EC3 filter documents without identified authorship or abstract, needed for screening in a further stage. EC4 filters out documents with less than four pages due to them being unlikely to sufficiently contribute to our research questions. EC5 takes into account English as the predominant scientific publication language within Computer Science and Human-Computer Interaction (we also wanted to be as inclusive as possible by including our native language, but we had no results). Lastly, EC6 states our interest in only considering documents that presumably went through a peer-review process. If a document satisfied any exclusion criterion, it was excluded from our review.

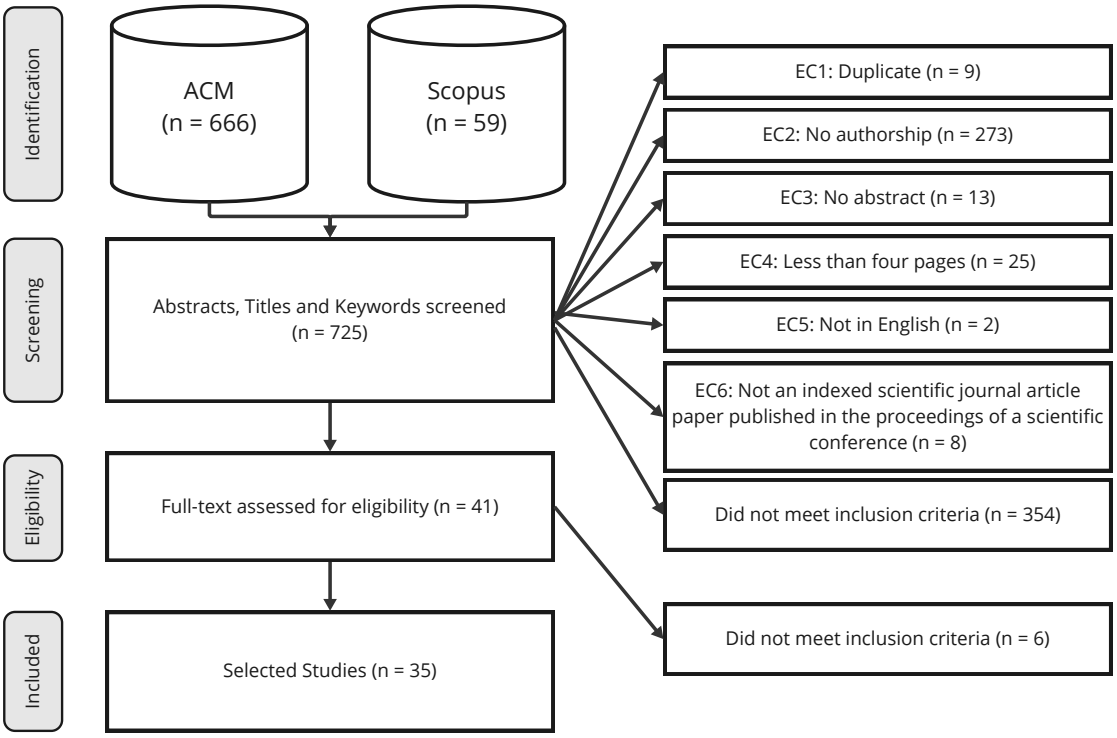

Figura 1. Search and selection flow diagram. Based on the PRISMA Flow Diagram [Moher et al. 2009].

[2]https://dl.acm.org/
[3]https://sol.sbc.org.br/busca/

Based on those exclusion criteria, we removed 330 studies, with 395 being carried to the next stage – it is worth noting that the substantial amount of studies excluded with EC2 encompass mostly entire conference proceedings, which would also have been excluded by EC6. Then, we proceeded to screen Title, Abstract and Keywords of remaining studies. Our objective here was to include only studies that contribute towards answering our research questions. To that objective, we defined the Inclusion Criteria (IC) as listed in Table 2. IC1 verifies whether the study features the creation, design, and/or assessment of a game. IC2 verifies whether the document discusses literacies under the umbrella of MIL (*e.g.*, media literacy, information literacy, digital literacy, AI literacy, *etc.*). Lastly, IC3 verifies whether the document addresses topics such as fake news, deepfakes, disinformation, or other forms of information manipulation.

Tabela 1. List of exclusion criteria (EC).

#	Exclusion Criterion
EC1	The document is a duplicate of another found work
EC2	The document does not have identified authorship
EC3	The document does not have an identified abstract
EC4	The document is composed of less than four pages
EC5	The document is not in English
EC6	The document is not an indexed scientific journal article or a paper published in the proceedings of a scientific conference

Tabela 2. List of inclusion criteria (IC).

#	Inclusion Criterion
IC1	The document describes the development or evaluation of one or more games
IC2	The document addresses literacies related to media and information literacy
IC3	The document covers phenomena related to information manipulation

Generative AI was used to assist in screening the articles while maintaining reliability and alignment with human judgment. We conducted the following steps: *1) Manual evaluation of a subset:* 39 documents (10% of the remaining studies) were manually reviewed based on the inclusion criteria; *2) AI-assisted evaluation:* the same subset was analyzed using ChatGPT4o, following a structured prompt designed to adopt the same criteria. The AI model was tasked with analyzing Title, Abstract, and Keywords and providing a YES/NO classification for each inclusion criterion, accompanied by a brief justification (The used prompt can be found in the appendix A); and *3) Agreement measurement:* the Cohen's Kappa [Cohen 1960] coefficient was calculated to assess the level of agreement between the human and AI evaluation. The resulting coefficients were 0.89 (almost perfect agreement), 0.57 (moderate agreement), and 1.00 (perfect agreement) for IC1, IC2 and IC3, respectively, with an overall coefficient of 0.86 (almost perfect agreement).

These results indicate that AI-assisted filtering achieved a satisfactory concordance with human evaluation. Therefore, we proceeded with AI-assisted filtering

for the remaining studies, with manual verification applied to borderline cases. During this stage, we found out that 41 studies adhered to all inclusion criteria, and those went through a human full-text evaluation of the same inclusion criteria as a final step. Finally, 35 studies were selected.

2.3. Analysis of Selected Studies

We extracted structured information from each study based on our research questions, ensuring a comprehensive understanding of how games have been used to promote Media and Information Literacy (MIL) and counter misinformation phenomena. For each research question, when found in the text, we annotated relevant excerpts in the document to be summarized, analyzed and discussed.

Regarding RQ1, we identified the primary literacy focus of each study as defined by their respective authors, classifying it into categories. Each literacy type was analyzed in terms of: the specific definitions adopted by the study; theoretical frameworks and references cited to support these definitions; and the types of misinformation disorders tackled within the study.

To address RQ2, we conducted an analysis of each intervention's design by merging two key dimensions: 1) Game Characteristics, which includes the game name and type, the primary genres and mechanics implemented, the level of player agency, the narrative structure, and the technologies employed in the game's development; and 2) Learning Approaches and Educational Frameworks, which includes the educational approach that underpins the game-based intervention by identifying the specific learning objectives and the curricula, frameworks, or educational guidelines referenced in each study.

For RQ3, we examined accessibility and inclusivity measures by searching the studies for explicit mentions of accessibility considerations.

Last but not least, for RQ4 we extracted details on: the objectives of the evaluation process; data collection methods utilized, including qualitative and quantitative approaches; the design of the evaluation, detailing experimental setups and control measures; and consideration of long-term impacts, including sustainability and potential educational improvements over time.

3. Results

The 35 selected studies encompass a diverse range of publication venues, with 28 articles published in academic journals and 7 papers in conference proceedings. The journal publications are widely distributed across different journals. Regarding conference proceedings, most papers were presented at different instances of the CHI Conference on Human Factors in Computing Systems. Analyzing the temporal distribution of publications, we found studies from 2019 to 2024 (noting that we knowingly did not filter our search by year), with an observable increase in research interest over recent years, indicating a growing recognition of the importance of digital games for media literacy. Geographically, the studies reflect a broad international scope, with contributions from North America, South America, Europe, Asia, and Oceania. The United States leads in representation, contributing 12 papers, followed by Sweden, Spain, and South Korea, each with two publications. Other contributing countries include Brazil, Scotland, Austria,

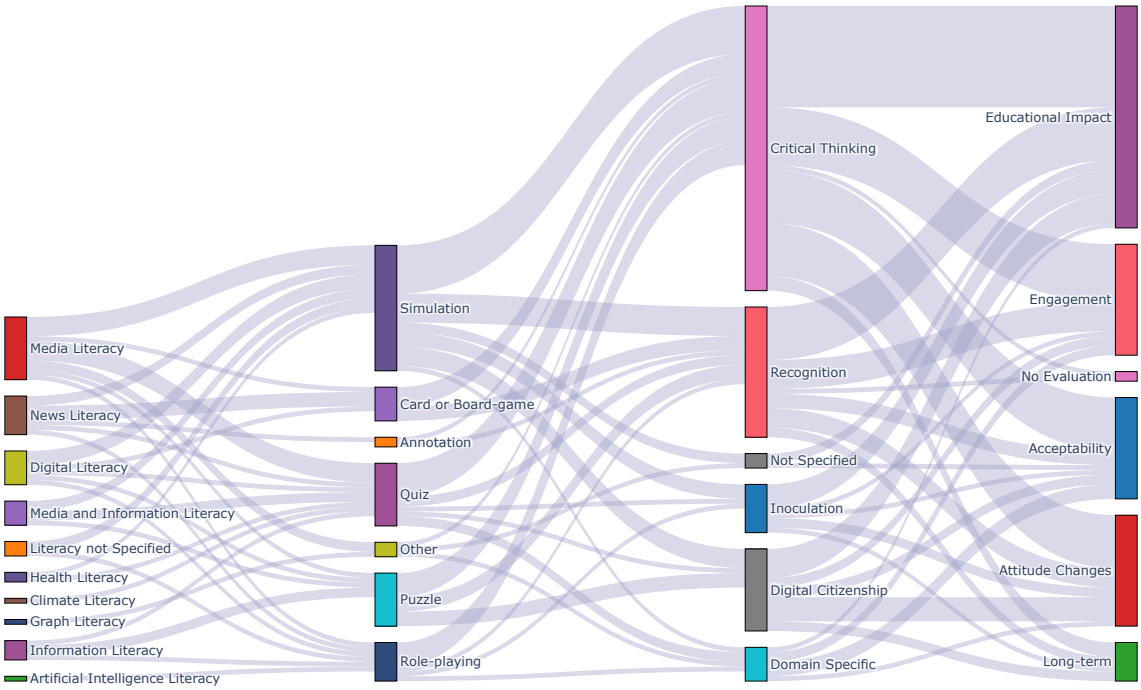

Figura 2. Relationships between literacy types, game mechanics, learning objectives, and evaluation methods across the surveyed papers.

Switzerland, Romania, Greece, Japan, Finland, Germany, the Netherlands, Canada, England, Thailand, Italy, Australia, Israel, and India.

To reveal how the various literacies, mechanics, learning objectives and evaluation methods interconnect across these 35 studies, we generated the Sankey diagram in Figure 2. We parsed each row of Table3 so that every listed literacy type produces a separate flow to each mechanic, every mechanic to each learning objective it supports, and every objective to its evaluation methods.

The Sankey diagram presents the connections between four key dimensions across the 35 analyzed studies: literacy types, game mechanics, learning objectives, and evaluation methods. It aims to reveal how these components interact in the design of media literacy games. The diagram is composed of four vertical columns: the first shows literacy types (e.g., Digital Literacy, News Literacy), the second contains game mechanics (e.g., Simulation, Quiz), the third lists learning objectives (e.g., Critical Thinking, Inoculation), and the fourth shows evaluation methods (e.g., Educational Impact, Acceptability). Bands connect each item to those in the next column, with width representing frequency. The most frequent path starts with Media Literacy, connected to Simulation, leading to Critical Thinking, and evaluated for Educational Impact. Other notable paths include News Literacy to Card or Board-games to Recognition. The diagram highlights a dominance of simulation-based games aiming at critical thinking, while showing fewer games using annotation mechanics or measuring long-term effects.

In the following, we'll discuss the aspects of the articles related to the research questions. A summary of the results is presented in Table 3.

Tabela 3. This table summarizes the key characteristics of the 35 studies included in this systematic literature review. It provides the citation for each study, the name of the featured game (if applicable), the primary literacy addressed, the game mechanics employed, the stated learning objectives, and the evaluation objectives of the study.

Ref.	Game	Literacy	Mechanics	Learning Objectives	Evaluation
[Axelsson et al. 2024]	Bad News Game	MIL	Simulation	Recognition, Inoculation, Critical Thinking	Educational Impact, Attitude Changes, Engagement
[Jeon et al. 2021]	ChamberBreaker	DL/NL	Simulation	Inoculation, Critical Thinking	Educational Impact, Attitude Changes
[Shrivastava et al. 2024]	Bot VoyAIge	AIL	Role-Playing	Critical Thinking, Domain Specific (AI Literacy)	Educational Impact, Engagement, Acceptability
[Dunleavy et al. 2024]	Latinos Unidos Microgames	ML/HL	Simulation, Quiz	Critical Thinking, Domain Specific (Health Literacy)	Acceptability
[Kiili et al. 2021]	Chart Trace	ML/GL	Other	Critical Thinking,Domain Specific(Graph Literacy)	Acceptability
[Barzilai et al. 2023]	Misinformation is Contagious	NS	Simulation	Critical Thinking, Digital Citizenship	Educational Impact, Attitude Changes
[Feltrero et al. 2023b]	BotBusters	MIL	Quiz	Recognition,Critical Thinking	Engagement, Acceptability
[Lersilp e Lersilp 2019]	MAthE the Game	ML/DL	Quiz	Critical Thinking	Educational Impact, Engagement, Acceptability
[Feltrero et al. 2023a]	BotBusters	MIL	Quiz	Critical Thinking, Domain Specific (SDG)	Attitude Changes, Engagement
[Tang e Singha 2024]	Mystery For You	DL	Role-playing	Critical Thinking	Engagement, Acceptability
[Literat et al. 2021]	LAMBOOZLED!	NL	Card or Board-game	Recognition, Critical Thinking	Educational Impact, Engagement
[Cook et al. 2023]	Cranky Uncle	CL	Quiz	Recognition, Inoculation	Educational Impact
[Angelelli et al. 2023]	Unnamed RPG	NS	Role-playing	Critical Thinking	Educational Impact
[Hinterreiter et al. 2024]	News Ninja	NL	Annotation	Recognition, Critical Thinking	Engagement
[Sun et al. 2024]	NewsGuesser	ML	Quiz	Critical Thinking, Digital Citizenship	Attitude Changes, Engagement
[Capecchi et al. 2024]	Social4School	DL	Simulation	Recognition, Critical Thinking	Attitude Changes, Engagement
[DeJong 2023]	Reactile, Lizards and Lies	DL	Puzzle, Card or Board-game	Recognition, Critical Thinking	N/A
[Rubio-Campillo et al. 2023]	Julia: A Science Journey	NS	Simulation	Not Specified	Educational Impact
[Cho et al. 2025]	The Euphorigen Investigation	IL	Puzzle	Recognition, Critical Thinking	Educational Impact, Acceptability
[Buchner 2024]	Escape the Fake	ML	Puzzle	Critical Thinking, Digital Citizenship	Educational Impact, Attitude Changes
[Literat et al. 2020]	Fakeopoly, The Lying Geese	ML/NL	Card or Board-game	Critical Thinking	Educational Impact, Attitude Changes, Acceptability
[Grace e Hone 2019]	Factitious	NL	Quiz	Critical Thinking	Educational Impact
[Adams 2023]	Werewolf on Campus	IL	Role-playing	Critical Thinking	Educational Impact, Long-term
[Cernicova-Buca e Ciurel 2022]	The Refugee Crisis Seen from Timisoara	ML/NL	Role-playing	Inoculation, Recognition, Critical Thinking	Educational Impact, Acceptability
[Barabas 2023]	Bad News Game, Breaking Harmony Square, Go Viral!	ML	Simulation	Inoculation, Recognition, Critical Thinking, Digital Citizenship	Educational Impact, Long-term
[Maekawa et al. 2021]	Brain Company	ML	Simulation	Critical Thinking, Digital Citizenship	Educational Impact, Attitude Changes, Acceptability
[Grace 2020]	Unnamed Prototypes	ML	Other	Not Specified	Acceptability
[Yang et al. 2021]	Trustme!	MIL	Simulation	Recognition, Critical Thinking	Educational Impact, Attitude Changes
[Maertens et al. 2021]	Bad News Game	ML	Simulation	Recognition, Critical Thinking, Digital Citizenship	Educational Impact, Long-term
[Wedlake et al. 2024]	The Euphorigen Investigation	MIL	Puzzle	Recognition, Critical Thinking, Digital Citizenship	Educational Impact, Attitude Changes
[Paraschivoiu et al. 2021]	Escape the Fake	IL	Puzzle	Critical Thinking, Digital Citizenship	Engagement, Acceptability
[Iyengar et al. 2023]	Bad News Game	DL	Simulation	Not Specified	Educational Impact
[Micallef et al. 2021]	Fakey	NL	Simulation	Recognition, Critical Thinking	Educational Impact, Engagement
[Chang et al. 2020]	LAMBOOZLED!	NL	Card or Board-game	Recognition, Critical Thinking	Educational Impact
[Sureephong et al. 2023]	How to Spot Fake News	ML/IL	Quiz	Critical Thinking	Educational Impact

Abbreviations used:
Literacy Types: MIL = Media and Information Literacy, DL = Digital Literacy, NL = News Literacy, ML = Media Literacy, IL = Information Literacy, CL = Climate Literacy, HL = Health Literacy, GL = Graph Literacy, AIL = AI Literacy, NS = Not Specified, SDG = Sustainable Development Goals.

3.1. Literacy Addressed

Despite similar approaches – most studies focused on evaluating information and using critical reasoning against fake news – the terminology for literacy varied. Some studies addressed multiple literacies, each counted separately. The most frequent terms were "*Media Literacy (ML)*" (11), "*News Literacy (NL)*" (9), and "*Digital Literacy*

(DL)" (7). The broader term "*Media and Information Literacy (MIL)*" (5) appeared less often, followed by "*Information Literacy (IL)*" (4). While three articles did not specify a literacy focus, four others explored unique areas: "*Health Literacy (HL)*" (COVID-19 misinformation) [Dunleavy et al. 2024]; "*Climate Literacy (CL)*" (climate change misinformation) [Cook et al. 2023]; "*Graph Literacy (GL)*" (interpreting data visualizations) [Kiili et al. 2021]; and "*AI Literacy (AIL)*" (understanding AI's role in media and social platforms) [Shrivastava et al. 2024]. When considering formal definitions for used terms, of the 35 analyzed studies, 19 (54.3%) did not provide any explicit definition for the literacy they addressed. The remaining 16 (45.7%) adopted or cited formal definitions.

We highlight here the sources that were mentioned by multiple studies:

- *UNESCO* [UNESCO 2021, UNESCO 1982, UNESCO 2020]: its contributions to Media and Information Literacy (MIL) are widely cited across five studies, particularly emphasizing MIL as a set of "essential life skills", encompassing media, information, and digital literacies, enabling meaningful civic engagement. Citing studies: [Axelsson et al. 2024, Cernicova-Buca e Ciurel 2022, Yang et al. 2021, Barabas 2023, Feltrero et al. 2023b].
- *European Commission* [European Commission 2020, Commission 2022b, Commission 2022a]: frequently referenced in the context of formal education and policy-driven interventions, underscoring the importance of coordinated policy efforts to strengthen digital and media literacy across Europe. Citing studies: [Axelsson et al. 2024, Cernicova-Buca e Ciurel 2022, Barzilai et al. 2023, Yang et al. 2021, Sureephong et al. 2023].
- *News Literacy Project* [News Literacy Project 2025]: focuses on the principles of news verification and responsible information sharing. Its guidelines emphasize the importance of pausing before sharing news, verifying sources, and recognizing how biases shape perceptions of credibility. Citing studies: [Jeon et al. 2021, Grace e Hone 2019, Feltrero et al. 2023b, Lersilp e Lersilp 2019].
- *David Buckingham* [Buckingham 2019, Buckingham 2020]: a leading proponent of a sociocultural approach to media literacy in opposition to an instrumentalist view, Buckingham argues for an approach that considers power structures, cultural contexts, and audience-producer dynamics. Citing studies: [Feltrero et al. 2023b, Literat et al. 2020].
- *Aufderheide's Report* [Aufderheide 1993]: argues that "Media literacy encompasses the ability of citizens to critically engage with, evaluate, and create information. It also includes understanding political, ideological, and commercial motives as well as hidden meanings" [Aufderheide 1993]. Citing studies: [Sureephong et al. 2023, Micallef et al. 2021].

3.2. Game Design

A total of 22 out of 35 selected studies offered a description of creative and design process of a new game-based intervention [Jeon et al. 2021, Kiili et al. 2021, Barzilai et al. 2023, Feltrero et al. 2023b, Shrivastava et al. 2024, Lersilp e Lersilp 2019, Tang e Singha 2024, Literat et al. 2021, Cook et al. 2023, Angelelli et al. 2023, Hinterreiter et al. 2024, Sun et al. 2024, Capecchi et al. 2024, Cho et al. 2025, Paraschivoiu et al. 2021, Grace e Hone 2019, Adams 2023,

Cernicova-Buca e Ciurel 2022, Yang et al. 2021, Maekawa et al. 2021, Micallef et al. 2021, Sureephong et al. 2023], 9 studies described an evaluation process for the educational impact of an existing intervention [Axelsson et al. 2024, Barabas 2023, Maertens et al. 2021, Iyengar et al. 2023, Feltrero et al. 2023a, Chang et al. 2020, Rubio-Campillo et al. 2023, Wedlake et al. 2024, Buchner 2024], and 4 studies described the iterative design process of more than one game [DeJong 2023, Literat et al. 2020, Grace 2020, Dunleavy et al. 2024]. Thus, our review went through the analysis of 34 different games.

3.2.1. Game Mechanics.

Out of the 34 games, 23 (67.6%) were exclusively digital, while the other 11 (32.4%) had at least one analog aspect: 3 were board games [Literat et al. 2020, Shrivastava et al. 2024, DeJong 2023], 1 had a tangible interface to interact with a Generative Artificial Intelligence [Tang e Singha 2024], 3 were card-based [Literat et al. 2021, Literat et al. 2020, Cernicova-Buca e Ciurel 2022], 2 were role-playing games [Angelelli et al. 2023, Adams 2023], and 2 were Escape Room experiences [DeJong 2023, Paraschivoiu et al. 2021]. Among these, two interventions featured unique AI functionalities: "Bot VoyAIge" [Shrivastava et al. 2024] is a board game that incorporates digital components to educate children about generative AI and its biases, while "A Mystery For You" [Tang e Singha 2024] uses a tangible interface to invite users to solve a mystery with the help of a generative AI tool. Based on the studies' descriptions, we found the following employed game genres:

- *Simulation*: Games that immerse players in realistic situations or media environments. For example, some games simulate social media feeds, in which players can select, share or block posts (*e.g.*, "Misinformation is Contagious" [Barzilai et al. 2023]), while others work as "Fake News Creator" simulations (*e.g.*, "Bad News Game" [Barabas 2023, Axelsson et al. 2024, Maertens et al. 2021], in which players have to create fake content in order to experiment and understand misinformation tactics. (12 games) [Axelsson et al. 2024, Barabas 2023, Maertens et al. 2021, Iyengar et al. 2023, Maekawa et al. 2021, Jeon et al. 2021, Micallef et al. 2021, Rubio-Campillo et al. 2023, Barzilai et al. 2023, Dunleavy et al. 2024, Capecchi et al. 2024, Yang et al. 2020].
- *Quiz*: Asks players to answer true/false or multiple-choice questions, or to promptly answer if a piece of content is reliable or fake, and receive immediate feedback with the correct answer. "How to Spot Fake News" [Sureephong et al. 2023], for instance, shows the players 6 news pieces, and requires a classification as True or False. (7 games) [Feltrero et al. 2023b, Feltrero et al. 2023a, Dunleavy et al. 2024, Cook et al. 2023, Grace e Hone 2019, Sureephong et al. 2023, Lersilp e Lersilp 2019, Sun et al. 2024].
- *Annotation*: Games in which players interact with texts by selecting fragments or words or sentences in order to flag bias or report disinformation (1 game) [Hinterreiter et al. 2024].
- *Card or Board-game*: Games that uses cards either to perform actions, involves moving pieces on a board or collecting resources. Inter-player discussion is

very relevant for those games. (4 games) [Literat et al. 2020, Literat et al. 2021, DeJong 2023].
- *Puzzle*: In our review, puzzle mechanics were found in Escape Rooms, in which players need to find clues, solve problems, and/or collaborate in timed-challenges. Leverages the social interaction between players. (3 games) [Paraschivoiu et al. 2021, DeJong 2023, Cho et al. 2025].
- *Role-playing*: Prompt players to assume characters in narrative-driven scenarios, simulating investigative roles. Games in this group often need a human-facilitator, that mediates the experience of the players, providing a description of the scenarios, possible actions and consequences. "A Mystery For You" [Tang e Singha 2024] is an exception, using a tangible interface to invite users to solve a mystery with the help of a generative AI tool. (5 games) [Angelelli et al. 2023, Shrivastava et al. 2024, Tang e Singha 2024, Cernicova-Buca e Ciurel 2022, Adams 2023].
- *Other*: Games that combine elements from multiple genres—such as platformers, real-time "shoot or dodge" mechanics (2 games) [Grace 2020, Kiili et al. 2021].

3.2.2. Learning Objectives.

In our review of 35 studies on game-based media literacy interventions, we extracted and categorized the learning objectives described by the authors. It is important to note that different studies may attribute different learning objectives to the same game — so the counts here represent studies, rather than unique games. Our analysis shows that most studies emphasize developing critical evaluation or critical thinking skills, while others focus on recognizing manipulative content, building resilience against misinformation, applying skills to domain-specific topics, and fostering responsible online behavior.

- *Recognition* (Identify Manipulation): Focuses on the ability to detect and identify manipulation techniques in media content. Players learn to spot tactics such as emotionally charged language, logical fallacies, polarization strategies, impersonation, conspiracy theories, and trolling [Barabas 2023]. For instance, in "News Ninja", players are required to analyze news content to detect biased word choices [Hinterreiter et al. 2024]. (14 studies) [Axelsson et al. 2024, Feltrero et al. 2023b, Feltrero et al. 2023a, Literat et al. 2021, Cook et al. 2023, Hinterreiter et al. 2024, Capecchi et al. 2024, DeJong 2023, Cho et al. 2025, Cernicova-Buca e Ciurel 2022, Barabas 2023, Yang et al. 2021, Maertens et al. 2021, Wedlake et al. 2024, Chang et al. 2020].
- *Inoculation* (Build Resilience): Inoculation goals aim to build psychological resistance against misinformation by exposing learners to controlled, weakened doses of disinformation. Players can then develop strategies to counteract or resist manipulative tactics in real-world situations. (5 studies) [Axelsson et al. 2024, Jeon et al. 2021, Cook et al. 2023, Cernicova-Buca e Ciurel 2022, Barabas 2023].
- *Critical Thinking*: To encourage players to engage in reflective analysis and debate regarding the content they encounter. This includes assessing the credibility of sources, evaluating evidence, and questioning underlying assumptions. Games with this goal might present scenarios where players must decide which information is trustworthy and justify their decisions.

(31 studies) [Axelsson et al. 2024, Jeon et al. 2021, Shrivastava et al. 2024, Dunleavy et al. 2024, Kiili et al. 2021, Barzilai et al. 2023, Feltrero et al. 2023b, Feltrero et al. 2023a, Lersilp e Lersilp 2019, Tang e Singha 2024, Literat et al. 2021, Angelelli et al. 2023, Hinterreiter et al. 2024, Sun et al. 2024, Capecchi et al. 2024, DeJong 2023, Cho et al. 2025, Buchner 2024, Literat et al. 2020, Grace e Hone 2019, Adams 2023, Cernicova-Buca e Ciurel 2022, Barabas 2023, Maekawa et al. 2021, Grace 2020, Maertens et al. 2021, Wedlake et al. 2024, Paraschivoiu et al. 2021, Micallef et al. 2021, Chang et al. 2020, Sureephong et al. 2023].

- *Domain Specific*: These objectives might focus on health literacy (e.g., distinguishing between accurate and misleading health information), graph literacy (e.g., interpreting data correctly), artificial intelligence (e.g., understanding AI biases), or climate science (e.g., evaluating environmental claims). (4 studies) [Shrivastava et al. 2024, Dunleavy et al. 2024, Kiili et al. 2021, Feltrero et al. 2023b].
- *Digital Citizenship*: Designed to promote responsible online behavior. They encourage players to be cautious when sharing information, understand the societal impact of media biases, and engage ethically in digital environments. For example, a game might require users to verify sources before disseminating information, in order to encourage a sense of civic responsibility. (7 studies) [Barzilai et al. 2023, Sun et al. 2024, Buchner 2024, Barabas 2023, Maekawa et al. 2021, Maertens et al. 2021, Wedlake et al. 2024].
- *Not Specified*: In some studies, the learning objectives were not explicitly defined or did not neatly fit into the above categories. In these cases, while the games still contribute to overall media literacy, the precise goals remain ambiguous. (2 studies) [Rubio-Campillo et al. 2023, Iyengar et al. 2023].

3.3. Accessibility

A consistent finding across the studies was the lack of explicit accessibility measures for participants with disabilities. Articles either did not mention any accommodations or simply noted that no specific strategies were employed to address accessibility. During their evaluation of the microgames created for the study, Dunleavy *et al.* [Dunleavy et al. 2024] received feedback from the players regarding lack of accessibility in the game (e.g. the letters were too small and the gameplay is too fast). Overall, the absence of standardized accessibility features highlights an important gap in the design and evaluation of media literacy games.

3.4. Evaluation Strategy

In total, our review identified 35 articles, with 34 of them reporting explicit evaluation data. The analysis of the evaluation design presents five broad areas of focus for their evaluation objectives, with studies having objectives from more than one group:

- *Educational Impact*: Evaluations with this objective were focusing on assessing how effectively games promote media literacy competencies. These studies measure whether players develop critical evaluation skills, improve their ability to detect misinformation, and meet other predefined learning outcomes after gameplay. (23

studies) [Axelsson et al. 2024, Jeon et al. 2021, Shrivastava et al. 2024, Barzilai et al. 2023, Lersilp e Lersilp 2019, Literat et al. 2021, Cook et al. 2023, Angelelli et al. 2023, Rubio-Campillo et al. 2023, Cho et al. 2025, Literat et al. 2020, Grace e Hone 2019, Adams 2023, Cernicova-Buca e Ciurel 2022, Barabas 2023, Maekawa et al. 2021, Yang et al. 2021, Maertens et al. 2021, Wedlake et al. 2024, Iyengar et al. 2023, Micallef et al. 2021, Chang et al. 2020, Sureephong et al. 2023].

- *Attitude Changes*: Investigates shifts in player behavior or attitudes, such as changes in news consumption habits, increased awareness of personal biases, or a general shift toward more critical media consumption. These evaluations examine whether the intervention leads to measurable changes in how players engage with and interpret media content. (10 studies) [Axelsson et al. 2024, Jeon et al. 2021, Barzilai et al. 2023, Feltrero et al. 2023a, Sun et al. 2024, Capecchi et al. 2024, Maekawa et al. 2021, Yang et al. 2021, Wedlake et al. 2024, Literat et al. 2020].
- *Engagement*: Focus on the evaluation of the level of player engagement and overall user experience. Evaluations in this category look at factors such as motivation, enjoyment, and the usability of the game interface over time. (12 studies) [Axelsson et al. 2024, Shrivastava et al. 2024, Feltrero et al. 2023b, Lersilp e Lersilp 2019, Feltrero et al. 2023a, Tang e Singha 2024, Literat et al. 2021, Hinterreiter et al. 2024, Sun et al. 2024, Capecchi et al. 2024, Paraschivoiu et al. 2021, Micallef et al. 2021].
- *Feasibility or Acceptability*: Identify gaps in the game design or content, assess whether the games are well-received by their target audiences, and determine if the interventions can be practically implemented in real-world settings. (12 studies) [Dunleavy et al. 2024, Kiili et al. 2021, Cho et al. 2025, Literat et al. 2020, Cernicova-Buca e Ciurel 2022, Maekawa et al. 2021, Grace 2020, Shrivastava et al. 2024, Feltrero et al. 2023b, Lersilp e Lersilp 2019, Tang e Singha 2024, Paraschivoiu et al. 2021].
- *Long-term Effects*: Evaluations that aim to explore the long-term durability of the interventions' effects. These studies assess whether the benefits observed immediately after gameplay persist over time, offering insights into the sustained impact. (3 studies) [Adams 2023, Barabas 2023, Maertens et al. 2021]

In terms of evaluation design, our review identified three distinct methodological approaches among the 34 studies that reported explicit evaluation data.

- *Quantitative Methods*: 17 studies relied exclusively on quantitative methods, using instruments such as standardized questionnaires and in-game log analytics to capture immediate cognitive and behavioral outcomes [Jeon et al. 2021, Kiili et al. 2021, Barzilai et al. 2023, Feltrero et al. 2023b, Feltrero et al. 2023a, Sun et al. 2024, Rubio-Campillo et al. 2023, Buchner 2024, Grace e Hone 2019, Cernicova-Buca e Ciurel 2022, Barabas 2023, Grace 2020, Yang et al. 2021, Maertens et al. 2021, Paraschivoiu et al. 2021, Iyengar et al. 2023, Sureephong et al. 2023].
- *Qualitative Methods:* A smaller subset of 3 studies employed exclusively qualitative approaches—using interviews, focus groups, or ethnographic observations—to gain in-depth insights into participants' experiences and perceptions [Dunleavy et al. 2024, Tang e Singha 2024, Literat et al. 2021].

- *Mixed-Methods Designs*: Fourteen studies integrated both quantitative and qualitative data, offering a more comprehensive evaluation by combining objective measurements with detailed participant feedback [Axelsson et al. 2024, Shrivastava et al. 2024, Lersilp e Lersilp 2019, Cook et al. 2023, Angelelli et al. 2023, Hinterreiter et al. 2024, Sun et al. 2024, Cho et al. 2025, Literat et al. 2020, Adams 2023, Maekawa et al. 2021, Wedlake et al. 2024, Micallef et al. 2021, Chang et al. 2020].

4. Discussion

This systematic literature review showed, through its 35 selected studies, a substantial diversity of theoretical and practical approaches towards the design and evaluation of Media Literacy Games. This a relatively new field of research, but it is expanding relatively fast in relevance, highlighting the contribution of this review and the importance of further investigations on the topic. We will now look back to our research questions to guide our discussion.

4.1. Instrumental and Sociocultural Literacy Approaches

Research Question 1 asks *"What kind of specific literacies, and respective references, are being addressed in Media Literacy Games?"* In this direction, among the diverse kinds of literacies addressed and definitions cited, our review reveals two main orientations toward defining literacy in the context of media, news, and information literacy:

- **Instrumentalist (Skill-Based) Definitions**: some studies define literacy – whether media, news, or information literacy – as a set of measurable competencies or behaviors. Examples include references to checklists, fact-checking strategies, and step-by-step processes (*e.g.*, "access, evaluate, create"). This approach often treats literacy as independent of social circumstances [Manca et al. 2021, Haider e Sundin 2022], focusing on "how to do it" rather than "why it matters in a given community."
- **Sociocultural (Non-Instrumentalist) Definitions**: others studies emphasize that literacy cannot be divorced from its real-world context – people's everyday practices, social identities, and local norms [Buckingham 2019, Buckingham 2020, Haider e Sundin 2022]. In these accounts, simply "transferring skills" is not enough; literacy evolves through participation in cultural practices and through power-sensitive analysis of how media shape (and are shaped by) society.

Many of the current media literacy games advocate for a more holistic approach, going beyond the identification of misinformation cues and including critical thinking, individual attitudinal changes, and ethical engagement with media consumption and creation. The game mechanics we found in many of the reviewed games, however, failed to reflect this broad approach, often focusing on skill-based competencies, breaking media literacy into discrete measurable tasks – such as specific source evaluation techniques and frameworks [Adams 2023, Sureephong et al. 2023], or how to identify manipulation techniques [Axelsson et al. 2024, Maertens et al. 2021, Barabas 2023, Paraschivoiu et al. 2021].

The contrast between these two approaches offers key insights for media literacy interventions. The instrumentalist model's strength lies in its clear, quantifiable objectives, which facilitate the design of game mechanics that reward specific skills. However, this model may overlook the broader sociocultural dimensions of media literacy. The sociocultural model, in contrast, provides a richer context by addressing the underlying social, cultural, and power structures that influence media production and consumption. While many existing media literacy games tend to rely on the instrumentalist approach, integrating sociocultural elements is a yet relatively little explored approach that could foster a more holistic learning experience – one that not only teaches skills but also encourages critical reflection and contextual awareness.

4.2. Design Strategies for Media Literacy Games

Research Question 2 asks *"What design strategies are employed in Media Literacy Games, and how are they aligned with or derived from the educational frameworks used to achieve their learning objectives?"* To answer this question, we must look at different aspects of game design that inform both the development and evaluation of these interventions. Thus, we identified three predominant approaches that shape the design of game-based interventions for media literacy. These strategies vary in their level of player agency. For Dewey, education "is a process of living and not a preparation for future living" [Dewey 1926], emphasizing the importance of immersive, participatory, and real-world reflective learning environments. This view aligns with constructivist learning theories, which argue that knowledge emerges through interaction and discovery, rather than passive reception [Piaget 2013]. In the context of games, this principle translates into player agency – the ability to make meaningful choices that shape their experience. As defined by Murray [Murray 2003], agency is "the satisfying power to take meaningful action and see the results of our decisions and choices."

In our analysis, we categorized agency levels as High, Medium, or Low based on the following criteria:

- **Freedom of Decision-Making:** The extent to which players can make meaningful choices that shape their experience.
- **Impact on Narrative and Gameplay:** Whether player actions influence the game's progression, structure, or outcomes.
- **Flexibility of Interaction:** The range of available strategies and whether game rules accommodate emergent play.
- **Creative and Expressive Possibilities:** The degree to which players can generate or modify content rather than merely selecting predefined options.
- **Emergent Complexity:** Whether game mechanics allow for unexpected consequences and dynamic experiences beyond rigid, pre-scripted interactions.

4.2.1. Instrumentalist, Linear Approaches (Low Agency)

Many games in our review relied on choice-based decision trees [Axelsson et al. 2024, Barabas 2023, Maertens et al. 2021, Dunleavy et al. 2024] or quiz-like mechanics [Dunleavy et al. 2024, Feltrero et al. 2023b, Feltrero et al. 2023a, Lersilp e Lersilp 2019, Cook et al. 2023, Grace e Hone 2019] for interaction and feedback, often guided

by Inoculation Theory—the concept that exposing people to weakened forms of misinformation can build mental "antibodies" against real-world manipulation [Barabas 2023, Jeon et al. 2021, Paraschivoiu et al. 2021]. In these interventions, players are prompted to select from predetermined options and receive immediate right-or-wrong responses. As a result, the games tend to follow a linear, fixed narrative structure that limits player agency. This design, while effective in measuring discrete skill improvements through pre- and post-test assessments, risks reducing media literacy to a mere checklist of procedural tasks rather than fostering a comprehensive understanding of the broader media ecosystem. This approach may bring the interventions closer to traditional educational environments, "where certain information is to be given, where certain lessons are to be learned, or where certain habits are to be formed"[Dewey 1926]. Players' actions don't seem to have impact in the game - besides the score - and their participation end up being more reactive than experimental, reducing the opportunities for creative problem-solving.

This instrumentalist skill-based approach to MIL learning is also reflected in the evaluation techniques employed by most studies, in which the success of the interventions is measured quantitatively through pre-post test assessment. We believe that the focus on discrete skills with clear quantitative metrics for evaluation provides a risk of reducing media literacy to a checklist of procedural tasks, rather than promoting a deeper understanding of the broader ecosystem.

4.2.2. Debate-Driven and Participatory Approaches (Medium to High Agency)

A subset of games goes beyond pre-scripted responses by integrating discussion-based mechanics and role-playing elements, allowing players to actively engage with misinformation scenarios. These approaches leverage constructivist learning principles, emphasizing interaction, reflection, and co-creation [Piaget 2013].

For example, LAMBOOZLED! [Literat et al. 2021] is a debate-driven card game where players construct and defend arguments about news stories, using different types of evidence and counterarguments. Rather than assigning right-or-wrong labels, these mechanics encourage critical discussion, strategic reasoning, and negotiation skills—skills that are often underdeveloped in linear approaches. Similarly, The Refugee Crisis Seen from Timisoara [Cernicova-Buca e Ciurel 2022] assigns players media roles (e.g., reductionist, alarmist, conspiracist), prompting them to analyze news through different perspectives, simulating real-world media framing strategies.

By allowing players to interrogate different perspectives and debate misinformation strategies, these games mirror real-world discourse, fostering critical thinking beyond binary fact-checking.

4.2.3. Open-Ended, Emergent Storytelling (High Agency)

Some media literacy games prioritizes non-deterministic storytelling, where players actively shape the narrative rather than following pre-scripted paths. These systems emphasize interpretation, systemic thinking, and complex decision-making, reflecting

real-world misinformation dynamics.

Role-playing games excel at emergent storytelling, as they allow for dynamic role-playing in which players make choices that meaningfully alter the story; unscripted, player-driven consequences, rather than preset narrative branches; and co-created storytelling, where the experience is shaped collaboratively rather than dictated by a predefined script.

In their study, Angelelli *et al.* [Angelelli et al. 2023] describe the experience with a Brazilian folklore-inspired role-playing game, where players dynamically debate misinformation and negotiate consequences with a game master, creating unpredictable emergent narratives. The open debates about the reliability of the game narrative and NPCs (non-playable characters), as well as the openness of consequences mediated by the human facilitator, allowed for the emergence of unique strategies by the players.

Role-playing interventions have a limited scalability due to their reliance on human facilitators or game-masters. However, games with digitally defined rules can also integrate emergent storytelling, as demonstrated by Mystery for You [Tang e Singha 2024], which employs GenAI to dynamically shape gameplay narratives based on player choices. Unlike games with fixed narratives, "Mystery for You" provides open-ended player interactions, fostering higher agency through interpretation and reflection rather than predefined solutions. In "Mystery for You", players take on the role of citizen fact-checkers, investigating a developing news story over seven in-game days. The game employs a tangible interface, where players insert physical cartridges into slots to select their action (e.g., "Investigate" or "Interview") and their target (e.g., "Local Police" or "Journalist"). These action-actor pairs determine how the narrative unfolds, triggering new printed news alerts generated by GenAI. Each new report incorporates the impact of previous player choices, ensuring that every playthrough results in a unique investigative journey. Players must carefully analyze the evolving information, deciding when to conclude their investigation and determine whether the news is true or false. The game's mechanics reinforce player agency through multiple investigative tools, including fact-checking messages, reverse image searches, and social media verification.

4.3. Considerations on Game Accessibility

Research Question 3 asks *"Are Media Literacy Games incorporating accessibility measures and design adaptations to cater to diverse audiences?"* The answer to that question reveals that a substantial population of players may not have access at all to Media Literacy Games, as our systematic review indicates that none of the studies explicitly mentioned game design measures to accommodate users with visual, auditory, motor, or cognitive impairments.

None of the reviewed studies described the integration of adaptive features – such as adjustable text sizes, alternative audio or video formats, high-contrast displays, or compatibility with assistive technologies like screen readers – into their game designs. For example, one study reported that users experienced difficulties with small fonts and rapid gameplay, issues that could have been mitigated by more thoughtful accessibility design [Dunleavy et al. 2024]. The lack of explicit accessibility measures has significant implications. As media literacy becomes ever more critical, excluding potential users not only diminishes the reach of the educational tools but also risks reinforcing existing

inequalities in digital access and learning opportunities.

This gap represents a promising avenue for future research. Integrating accessibility features as requirements in the design process – such as adjustable text sizes, alternative media formats, high-contrast displays, and compatibility with assistive technologies — offers significant potential to democratize media literacy education. Embedding accessibility from the beginning – instead of overseeing it or considering it as an afterthough – could create more inclusive learning environments, ensuring that all users access these interventions.

4.4. Evaluating Media Literacy Games

Research Question 4 asks *"How are Media Literacy Games being evaluated in terms of objectives, methodologies and metrics?"* We found that the evaluation of Media Literacy Games in the reviewed studies predominantly reflects an instrumentalist stance, emphasizing quantifiable outcomes. A substantial number of studies employed rigorous quantitative methods to measure changes in media literacy skills, such as pre– and post–test questionnaires, standardized Likert scale surveys, and controlled experimental designs. For instance, many articles reported using statistical comparisons to evaluate shifts in accuracy judgments, reliability ratings, and other measurable competencies (*e.g.*, [Axelsson et al. 2024, Jeon et al. 2021, Maertens et al. 2021]).

However, our review also reveals promising alternative evaluation approaches that capture the more nuanced, sociocultural dimensions of media literacy. A subset of studies incorporated qualitative methods to explore how players interpret and internalize media literacy concepts within their real-world contexts, such as focus groups, semi-structured interviews, and ethnographic observations (*e.g.*, [Angelelli et al. 2023, Wedlake et al. 2024]). These methods provide deeper insights into players' cognitive and affective responses, including shifts in attitudes and the development of critical thinking, aspects that may not be fully captured by quantitative metrics alone.

Moreover, several studies have taken advantage of in–game analytics to obtain real-time data on player behavior. By automatically recording interaction metrics (such as decision times, accuracy in fact-checking tasks, and engagement levels), these studies offer an innovative means to assess the dynamic and iterative aspects of learning. For example, in some digital interventions, in–game logs were used to track player activity [Feltrero et al. 2023b, Feltrero et al. 2023a, Rubio-Campillo et al. 2023, Lersilp e Lersilp 2019, Tang e Singha 2024, Grace e Hone 2019, Cernicova-Buca e Ciurel 2022, Maekawa et al. 2021, Grace 2020, Micallef et al. 2021]. This approach not only complements traditional survey methods but also allows for continuous monitoring.

Together, these evaluation strategies highlight a dual trajectory in the field. On one hand, the strong focus on quantitative assessments reinforces the instrumentalist model by providing clear, measurable indicators of media literacy competency. On the other hand, the incorporation of qualitative insights and in–game metrics opens new avenues for understanding how games can foster a deeper, contextually rich form of learning – one that accounts for the complex interplay of cognitive, cultural, and social factors in the process of media literacy acquisition. Future research should aim to further integrate these methods to capture both the immediate and sustained impacts of media literacy games.

5. Conclusion and Future Work

Our systematic review indicates that the majority of media literacy games adopt an instrumentalist approach, focusing on discrete skill sets such as fact-checking and source evaluation. These interventions are primarily designed using inoculation theory and linear, choice-based structures that yield measurable improvements in specific competencies. However, such approaches often limit player agency and may not fully capture the complex sociocultural dimensions essential for robust media literacy. The evaluation methodologies are predominantly quantitative—relying on pre– and post–test designs—which, although effective in measuring immediate cognitive gains, may overlook the subtler shifts in critical thinking and attitudinal change.

By juxtaposing these dominant trends with emergent sociocultural approaches, this review contributes to the state of the art by revealing important tensions and gaps in the current landscape of MIL game design. Notably, we highlight a lack of integration between behaviorist learning frameworks and more contextual, participatory, and meaning-making strategies that consider the infrastructural and emotional dimensions of media consumption.

Looking forward, we propose three promising directions for future research:

- Integrative Design Approaches: Future efforts should aim to bridge the gap between instrumentalist and sociocultural approaches. Designing hybrid games that not only build specific skills but also allow players to critically engage with context, power dynamics, and their own media practices could foster a more holistic form of MIL learning.
- Exploration of Commercial Games: While most existing research focuses on educational games explicitly designed for MIL, future studies could explore how commercial game may support MIL-related objectives. Mapping potential learning outcomes embedded in mainstream titles can reveal unexplored pedagogical value.
- Accessibility Guidelines and Inclusive Design: Our review exposes an absence of accessibility features across the reviewed games. Future studies should investigate the application of universal design principles and adaptive technologies within MIL game environments. This includes not only the incorporation of alternative media formats (e.g., subtitles, screen readers, simplified interfaces), but also the consideration of cultural diversity in both game design and content representation.

Ultimately, this work contributes to the broader discourse on media and information literacy by advocating for an expanded, interdisciplinary, and inclusive perspective. Media literacy games, if thoughtfully designed and evaluated, have the potential to transcend didactic instruction and instead offer dynamic, reflective, and empowering learning experiences in a digitally saturated world.

6. Ethical Concerns

This study did not involve research with human participants.

Acknowledgments

This study was financed, in part, by the São Paulo Research Foundation (FAPESP), Brasil, Process Number #2024/16790-5; and by the Universidade Estadual de Campinas

(UNICAMP), Brasil, FAEPEX grant #2356/24. Generative AI was used under human supervision to review and improve the writing quality of this paper.

Referências

Adams, A. D. (2023). Werewolf on campus: A case study in inoculation theory and gamified one-shot library instruction. *Public Services Quarterly*, 19(4):255–272.

Angelelli, C. V., de Campos Ribeiro, G. M., Severino, M. R., Johnstone, E., Borzenkova, G., e da Silva, D. C. O. (2023). Developing critical thinking skills through gamification. *Thinking Skills and Creativity*, 49:101354.

Aufderheide, P. (1993). Media literacy. a report of the national leadership conference on media literacy. Technical Report ED365294, Education Resources Information Center.

Axelsson, C.-A. W., Nygren, T., Roozenbeek, J., e van der Linden, S. (2024). Bad news in the civics classroom: How serious gameplay fosters teenagers' ability to discern misinformation techniques. *Journal of Research on Technology in Education*.

Barabas, R. (2023). What's the news about bad news? a review of bad news games as a tool to teach media literacy. *Libri*, 73(4):283–292.

Barzilai, S., Mor-Hagani, S., Abed, F., Tal-Savir, D., Goldik, N., Talmon, I., e Davidow, O. (2023). Misinformation is contagious: Middle school students learn how to evaluate and share information responsibly through a digital game. *Computers & Education*, 202:104832.

Buchner, J. (2024). Playing an augmented reality escape game promotes learning about fake news. *Technology, Knowledge and Learning*, 30:425–445.

Buckingham, D. (2006). Defining digital literacy – what do young people need to know about digital media? *Nordic Journal of Digital Literacy*, 1(4):263–277.

Buckingham, D. (2019). *The Media Education Manifesto*. The manifesto series. Polity Press, Cambridge, UK; Medford, MA, USA.

Buckingham, D. (2020). Epilogue: Rethinking digital literacy: Media education in the age of digital capitalism. *Digital Education Review*, 37:230–239.

Bulger, M. e Davison, P. (2018). The promises, challenges, and futures of media literacy. Technical report, Data & Society Institute, New York, NY, USA.

Capecchi, S., Lieto, A., Patti, F., Pensa, R. G., Rapp, A., Vernero, F., e Zingaro, S. (2024). A gamified platform to support educational activities about fake news in social media. *IEEE Trans. Learn. Technol.*, 17:1805–1819.

Cernicova-Buca, M. e Ciurel, D. (2022). Developing resilience to disinformation: A game-based method for future communicators. In *Proceedings of the 2022 International Conference on Communication and Media Studies*.

Chang, Y. K., Literat, I., Price, C., Eisman, J. I., Chapman, A., Gardner, J., e Truss, A. (2020). News literacy education in a polarized political climate: How games can teach youth to spot misinformation. *Harvard Kennedy School (HKS) Misinformation Review*.

Cho, Y., Coward, C., Lackner, J., Windleharth, T. W., e Lee, J. H. (2025). The use of an escape room as an immersive learning environment for building resilience to misinformation. *Journal of Librarianship and Information Science*, 57(2):524–538.

Cohen, J. (1960). A coefficient of agreement for nominal scales. *Educational and Psychological Measurement*, 20(1):37–46.

Commission, E. (2022a). Digital education action plan (2021-2027). `https://education.ec.europa.eu/focus-topics/digital-education/action-plan`. Accessed on: August, 20 2025.

Commission, E. (2022b). Final report of the commission expert group on tackling disinformation and promoting digital literacy through education and training (tech. rep. no. nc-03-22-016-en-n). `https://op.europa.eu/en/publication-detail/-/publication/72421f53-4458-11ed-92ed-01aa75ed71a1/language-en`. Accessed on: August 20, 2025.

Contreras-Espinosa, R. S. e Eguia-Gomez, J. L. (2023). Evaluating video games as tools for education on fake news and misinformation. *Computers*, 12(9).

Cook, J., Ecker, U. K. H., Trecek-King, M., Schade, G., Jeffers-Tracy, K., Fessmann, J., Kim, S. C., Kinkead, D., Orr, M., Vraga, E., Roberts, K., e McDowell, J. (2023). The cranky uncle game—combining humor and gamification to build student resilience against climate misinformation. *Environmental Education Research*, 29(4):607–623.

Dadakhonov, A. (2024). Analysis of media and information literacy definitions: A qualitative approach. *Studies in Media and Communication*.

DeJong, S. (2023). Making the digital tangible through analog games: Design retrospective of digital literacy games. In *HCI in Games: 5th International Conference, HCI-Games 2023, Held as Part of the 25th HCI International Conference, HCII 2023, Copenhagen, Denmark, July 23–28, 2023, Proceedings Part I*, page 66–80, Berlin, Heidelberg. Springer-Verlag.

Dewey, J. (1926). *My Pedagogic Creed*. SAGE Publishing.

Dunleavy, V. O., Ahn, R. J., Grace, L. D., e Mayo, D. (2024). Acceptability and feasibility of "latinos unidos": A microgame resource combatting health misinformation for latinos living with hiv. *Journal of Health Communication*, 29(5):307–318. PMID: 38592967.

European Commission (2020). Action plan against disinformation. `https://www.eca.europa.eu/lists/ecadocuments/ap20_04/ap_disinformation_en.pdf`. Accessed on: August 20, 2025.

Feltrero, R., Hernando, S., e Ionescu, A. (2023a). E-learning strategies for media literacy: Engagement of interactive digital serious games for understanding visual online disinformation. *American Journal of Distance Education*, 37(4):276–293.

Feltrero, R., Junguitu-Angulo, L., e Osuna-Acedo, S. (2023b). Deploying sdg knowledge to foster young people's critical values: A study on social trends about sdgs in an educational online activity. *Sustainability*, 15(8).

Glas, R., van Vught, J., Fluitsma, T., Hera, T. D. L., e Gómez-García, S. (2023). Literacy at play: an analysis of media literacy games used to foster media literacy competencies. *Frontiers in Communication*, 8.

Grace, L. (2020). Pilot case study in games as polling systems, generating knowledge about fake news. In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*, CHI EA '20, page 1–8, New York, NY, USA. Association for Computing Machinery.

Grace, L. e Hone, B. (2019). Factitious: Large scale computer game to fight fake news and improve news literacy. In *Extended Abstracts of the 2019 CHI Conference on Human Factors in Computing Systems*, CHI EA '19, page 1–8, New York, NY, USA. Association for Computing Machinery.

Gregory, S. (2023). Fortify the truth: How to defend human rights in an age of deepfakes and generative ai. *Journal of Human Rights Practice*, 15(3):702–714.

Haider, J. e Sundin, O. (2022). *Paradoxes of Media and Information Literacy: The Crisis of Information*. Routledge.

Hinterreiter, S., Spinde, T., Oberdörfer, S., Echizen, I., e Latoschik, M. E. (2024). News ninja: Gamified annotation of linguistic bias in online news. *Proc. ACM Hum.-Comput. Interact.*, 8(CHI PLAY).

Iyengar, A., Gupta, P., e Priya, N. (2023). Inoculation against conspiracy theories: A consumer side approach to india's fake news problem. *Applied Cognitive Psychology*, 37(2):290–303.

Jeon, Y., Kim, B., Xiong, A., Lee, D., e Han, K. (2021). Chamberbreaker: Mitigating the echo chamber effect and supporting information hygiene through a gamified inoculation system. *Proceedings of the ACM on human-computer interaction*.

Kiili, K., Lindstedt, A., Ninaus, M., e Nylén, T. (2021). Using a multi-step research approach to inform the development of a graph literacy game. In *Games and Learning Alliance: 10th International Conference, GALA 2021, La Spezia, Italy, December 1–2, 2021, Proceedings*, page 78–88, Berlin, Heidelberg. Springer-Verlag.

Lersilp, T. e Lersilp, S. (2019). Use of information technology for communication and learning in secondary school students with a hearing disability. *Education Sciences*, 9(1).

Literat, I., Chang, Y. K., Eisman, J., e Gardner, J. (2021). LAMBOOZLED!: The design and development of a game-based approach to news literacy education. *Journal of Media Literacy Education*, 13(1):56–66.

Literat, I., Chang, Y. K., e Hsu, S.-Y. (2020). Gamifying fake news: Engaging youth in the participatory design of news literacy games. *Convergence*, 26(3):503–516.

Maekawa, M., Hundzinski, L., Chandrahera, S., Tajima, S., Nakai, S., Miyazaki, Y., e Okawa, K. (2021). Design of a social media simulator as a serious game for a media literacy course in japan. In Csapo, B. e Uhomoibhi, J., editors, *CSEDU 2021 - Proceedings of the 13th International Conference on Computer Supported Education*, International Conference on Computer Supported Education, CSEDU - Proceedings, pages 392–399. Science and Technology Publications, Lda. Publisher Copyright:

Copyright © 2021 by SCITEPRESS – Science and Technology Publications, Lda. All rights reserved; 13th International Conference on Computer Supported Education, CSEDU 2021 ; Conference date: 23-04-2021 Through 25-04-2021.

Maertens, R., Roozenbeek, J., Basol, M., e van der Linden, S. (2021). Long-term effectiveness of inoculation against misinformation: Three longitudinal experiments. *Journal of Experimental Psychology: Applied*, 27(1):1–16.

Manca, S., Bocconi, S., e Gleason, B. W. (2021). "think globally, act locally": A glocal approach to the development of social media literacy. *Computers in Education*.

Micallef, N., Avram, M., Menczer, F., e Patil, S. (2021). Fakey: A game intervention to improve news literacy on social media. *Proc. ACM Hum.-Comput. Interact.*, 5(CSCW1).

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., e Group, T. P. (2009). Preferred reporting items for systematic reviews and meta-analyses: The prisma statement. *PLOS Medicine*, 6(7):1–6.

Molnar, A. e Kostkova, P. (2013). On effective integration of educational content in serious games: Text vs. game mechanics. In *Proceedings of the 2013 IEEE 13th International Conference on Advanced Learning Technologies*, ICALT '13, page 299–303, USA. IEEE Computer Society.

Murray, J. (2003). *Hamlet no Holodeck: O Futuro da Narrativa no Ciberespaço*. Editora Unesp.

News Literacy Project (2025). Information hygiene: Sanitize before you share. `https://newslit.org/tips-tools/information-hygiene-sanitize-before-you-share/`. Accessed on: August 20, 2025.

Paraschivoiu, I., Buchner, J., Praxmarer, R., e Layer-Wagner, T. (2021). Escape the fake: Development and evaluation of an augmented reality escape room game for fighting fake news. In *Extended Abstracts of the 2021 Annual Symposium on Computer-Human Interaction in Play*, CHI PLAY '21, page 320–325, New York, NY, USA. Association for Computing Machinery.

Piaget, J. (2013). *A Psicologia da Inteligência*. Vozes, Petrópolis, RJ. Tradução de Guilherme João de Freitas Teixeira.

Rosenberg, L. (2023). The manipulation problem: Conversational ai as a threat to epistemic agency. `https://arxiv.org/abs/2306.11748`. Accessed on: August 20, 2025.

Rubio-Campillo, X., Marín-Rubio, K., e Corral-Vázquez, C. (2023). Using in-game analytics to explore learning dynamics of information literacy in a social media simulator. In *Proceedings of the 17th European Conference on Games Based Learning (ECGBL 2023)*, pages 556–563.

Shrivastava, V., Sharma, S., Chakraborty, D., e Kinnula, M. (2024). Is a sunny day bright and cheerful or hot and uncomfortable? young children's exploration of chatgpt. *Nordic Conference on Human-Computer Interaction*.

Sun, L., Zhang, H., Liu, E., Liu, M., e Vaccaro, K. (2024). Newsguesser: Using curiosity to reduce selective exposure. *Proc. ACM Hum.-Comput. Interact.*, 8(CSCW1).

Sureephong, P., Chernbumroong, S., Sangamuang, S., Sirasakamol, O., Intawong, K., e Puritat, K. (2023). Enhancing information literacy for spotting fake news: A study on the efficacy of a serious game for m-learning across different age groups. *International Journal of Interactive Mobile Technologies (iJIM)*, 17(15):pp. 103–119.

Tang, H. e Singha, M. (2024). A mystery for you: A fact-checking game enhanced by large language models (llms) and a tangible interface. In *Extended Abstracts of the CHI Conference on Human Factors in Computing Systems*, CHI EA '24, New York, NY, USA. Association for Computing Machinery.

UNESCO (1982). The grünwald declaration on media education. https://milobs.pt/wp-content/uploads/2018/06/The-Gr%C3%BCnwald-Declaration-on-Media-Education.pdf. Accessed on: August 20, 2025.

UNESCO (2020). Seoul declaration on media and information literacy for everyone and by everyone. https://www.unesco.org/en/articles/seoul-declaration-media-and-information-literacy-everyone-and-everyon Accessed on: August 20, 2025.

UNESCO (2021). Media and information literacy curriculum for educators and learners: Think critically, click wisely! https://unesdoc.unesco.org/ark:/48223/pf0000377068. Accessed on: August 20, 2025.

UNESCO (2021). Media and information literacy (mil) - communication and information programme. https://unesdoc.unesco.org/ark:/48223/pf0000375369. Accessed on: August 20, 2025.

Wedlake, S., Coward, C., e Lee, J. H. (2024). How games can support misinformation education: A sociocultural perspective. *J. Assoc. Inf. Sci. Technol.*, 75(13):1480–1497.

Yang, S., Lee, J. W., Kim, H.-J., Kang, M., Chong, E., e mee Kim, E. (2020). Can an online educational game contribute to developing information literate citizens? *Computers & Education*.

Yang, S., Lee, J. W., Kim, H.-J., Kang, M., Chong, E., e mee Kim, E. (2021). Can an online educational game contribute to developing information literate citizens? *Computers & Education*, 161:104057.

A. Appendix

A.1. Prompt for Inclusion Criteria Evaluation

The following prompt (here presented as originally submitted in Brazilian Portuguese) was used in ChatGPT 4o to evaluate the Title, Keywords and Abstracts of the articles according to the inclusion criteria.

Contexto: Este trabalho está inserido em um projeto de Mapeamento Sistemático da Literatura, cujo objetivo é identificar produções acadêmicas que descrevem o desenvolvimento ou a análise de jogos voltados para o letramento midiático e informacional, com foco na promoção do pensamento crítico em relação a informações falsas. O pesquisador busca explorar estudos que envolvem jogos como o objeto principal, excluindo artigos com abordagens exclusivamente teóricas ou revisões bibliográficas.

O mapeamento foca em responder perguntas-chave como:

Qual tipo de letramento é abordado? (midiático, informacional, digital, etc.) Qual é o tipo de jogo? (educacional, digital, de tabuleiro, entre outros) Qual é o tipo de aprendizado proposto pelo jogo? (construtivista, behaviorista, entre outros) Qual é o público-alvo? Quais estratégias de avaliação são adotadas? Critérios de Inclusão: A etapa atual do mapeamento envolve a triagem de artigos com base em três critérios específicos:

CI1: Apresenta um ou mais jogos (design ou avaliação)

O artigo deve descrever o desenvolvimento ou a análise de um ou mais jogos, ou seja, o jogo precisa ser um componente central no estudo. Excluem-se artigos que não tratem diretamente do design ou avaliação de jogos. CI2: Letramento relacionado a Letramento Midiático e Informacional

O artigo deve abordar letramento incluído no escopo de Letramento Midiático e Informacional, podendo envolver temas como letramento digital, letramento midiático, letramento informacional, letramento em IA, entre outros. Excluem-se artigos que não tratem desses aspectos. CI3: Aborda fenômenos relacionados à manipulação de informação

O artigo deve discutir fenômenos como fake news, desinformação, deepfakes ou outros tópicos relacionados à manipulação de informação. Tarefa: A inteligência artificial deve ler o título, abstract e keywords de cada artigo e verificar se cada critério de inclusão (CI1, CI2 e CI3) é atendido, respondendo SIM ou NÃO para cada critério com base nas informações fornecidas.

Exemplo de Resposta para Avaliação de Artigos:

Para cada artigo, a IA deve apresentar uma resposta estruturada no seguinte formato:

Título do artigo: Título Aqui CI1: SIM/NÃO CI2: SIM/NÃO CI3: SIM/NÃO Instruções Adicionais:

A IA deve garantir que, mesmo que o título ou abstract faça referências vagas ou indiretas a qualquer critério, apenas artigos que claramente satisfaçam os critérios recebem uma resposta "SIM". A IA deve ter como foco identificar jogos aplicados ou analisados em contextos de letramento midiático e informacional, e evitar confundir outros tipos de letramento ou treinamento que não se relacionem com esses conceitos.

A triagem atual é uma etapa de pré-seleção, com o objetivo de refinar o conjunto de estudos a serem analisados mais profundamente nas próximas fases. Ao longo do processo, a IA já aplicou esses critérios em uma lista de artigos e aprendeu que:

Jogos voltados para habilidades específicas como letramento em saúde (ex: combate a desinformação em saúde) são incluídos, desde que cumpram todos os critérios. Artigos que utilizam "gamificação" em contextos que não envolvem letramento midiático ou informacional ou que não abordam manipulação de informação (fake news, etc.) são excluídos. O critério CI3 é um dos mais específicos e frequentemente requer atenção para identificar o foco em manipulação de informação, especialmente em casos onde o artigo pode abordar literacias digitais ou midiáticas de forma geral, mas sem tocar em fenômenos como fake news ou desinformação.