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Media Education and Critical Thinking Skills: A Bibliometric Mapping of Research Development (1996–2025)

Shahid Rafiq [a], Ayesha Afzal [b, *], Uzma Niaz [a]

[a] Emerson University Multan, Pakistan
[b] University of Management and Technology, Lahore, Pakistan

Abstract

This study presents a comprehensive bibliometric analysis of global research at the intersection of media education and critical thinking from 1996 to 2025, utilizing a curated dataset of 2,376 peer-reviewed articles extracted from the Web of Science Core Collection. Following systematic filtering by document type (articles), language (English), and disciplinary relevance (education, media and communication, and social sciences), the analysis was conducted using the Bibliometrix R package and the Biblioshiny interface. Key indicators, including annual scientific production, citation trends, author productivity, source dynamics, institutional output, and international collaboration, reveal a steady increase in research activity, with a significant acceleration after 2015 and peaking in 2025. Conceptual structure mapping identified dominant themes including media literacy, digital literacy, misinformation, and critical thinking among youth, with keywords such as fake news, social media, and education emerging as high-frequency terms. Thematic evolution and coupling analysis showed a shift from foundational media literacy to more critical, digitally embedded pedagogical models. Despite the field's growth, key gaps remain, particularly the underrepresentation of Global South regions, the limited number of intervention-based empirical studies, and a lack of integration between cognitive and pedagogical frameworks. Collaboration networks reveal a concentration of output among a few academic institutions and authors, primarily in the United States, Western Europe, and Australia. This study presents a comprehensive synthesis of the field's development over three decades, offering actionable insights for researchers, policymakers, and educators seeking to align their future work with evolving global and technological contexts.

Keywords: Media education, critical thinking, misinformation, digital literacy, global research trends, educational technology, media literacy.

1. Introduction

In the 21st century, the ubiquity of digital technologies has redefined the educational landscape, with media emerging as both a pedagogical tool and a cultural force. The concept of media education, which traditionally emphasized understanding media forms and content, has evolved into a multidimensional construct involving critical engagement, digital literacy, and civic participation (Buckingham, 2007; Livingstone, 2004). As digital platforms reshape how individuals' access, interpret, and disseminate information, the need for equipping learners with critical thinking skills has gained global prominence. These skills, encompassing analysis, evaluation, inference, and self-regulation, are essential not only for academic success but also for

* Corresponding author
E-mail addresses: ayeshaafzal@umt.edu.pk (A. Afzal)

navigating complex information ecosystems and resisting misinformation (Facione, 2011; Kahne, Bowyer, 2016). Consequently, the intersection of media education and critical thinking has emerged as a vital domain of scholarly inquiry and educational practice.

The rise of media literacy as a core educational competency reflects growing concerns about the role of media in shaping beliefs, attitudes, and knowledge. Media literacy education, particularly within formal schooling, seeks to cultivate the capacity to question media content, understand production techniques, and identify ideological bias (Hobbs, 2011). This critical orientation aligns with broader goals of education aimed at fostering reflective, independent thinkers who can navigate diverse perspectives. Simultaneously, critical thinking has been recognized by global educational frameworks, such as UNESCO's Education 2030 Agenda and the OECD's Future of Education and Skills 2030, as a foundational skill necessary for lifelong learning and democratic citizenship (Grizzle et al., 2014; OECD, 2019). While these two domains, media education and critical thinking, have developed along parallel trajectories, their conceptual overlap and mutual reinforcement have been increasingly acknowledged in recent years (Tommasi et al., 2021).

Despite the growing attention to the synergistic relationship between media literacy and critical thinking, academic literature remains fragmented. Scholars have explored various facets of this intersection, ranging from the media's influence on reasoning and judgment to the use of digital tools in critical pedagogy, but often within isolated disciplinary contexts (Martens, Hobbs, 2015; Mihailidis, Viotty, 2017). The result is a disjointed field, where empirical findings and theoretical contributions are scattered across education, communication studies, psychology, and media studies. This fragmentation poses challenges for synthesizing knowledge, identifying trends, and building coherent frameworks that bridge practice and policy. Moreover, there is an evident lack of large-scale, systematic reviews that trace how this intersection has evolved, particularly in light of technological, geopolitical, and educational shifts over the past two decades.

The absence of a comprehensive bibliometric synthesis represents a significant gap in the literature. While prior studies have reviewed critical thinking development or the evolution of media literacy (Vuojärvi et al., 2021), no one has employed bibliometric mapping to chart the co-development of these fields. Bibliometric analysis offers a powerful methodological approach to address this gap by quantitatively analyzing the structure, dynamics, and thematic evolution of scholarly output (Donthu et al., 2021). By leveraging techniques such as co-citation, co-word, and thematic mapping, researchers can uncover intellectual foundations, collaborative networks, and emerging areas of inquiry. Such an approach not only enhances the transparency of research landscapes but also provides strategic guidance for scholars, educators, and policymakers.

The present study addresses this lacuna by offering a bibliometric mapping of research connecting media education and critical thinking from 1996 to 2025. Drawing on data from the Web of Science database, this study traces global publication trends, identifies key authors and journals, visualizes conceptual clusters, and uncovers evolving research themes. The focus is on understanding how media education has been conceptualized as a mechanism for critical thinking development, and how scholarly interest in this intersection has unfolded over the last two decades.

To guide this inquiry, the following research questions (RQs) are proposed:

1. What is the growth pattern and geographic distribution of research on media education and critical thinking from 1996–2025?

This question investigates temporal dynamics and the contributions of countries and institutions to the global research landscape.

2. What are the key thematic areas and intellectual structures in this field?

This includes the identification of dominant research clusters, foundational authors, and core theoretical frameworks shaping the discourse.

3. What emerging trends, influential authors, and key publication sources shape this area?

It aims to highlight intellectual momentum, evolving topical interests, and leading journals that define the research ecosystem.

4. What gaps or underexplored areas can be identified for future research?

This forward-looking question seeks to chart possible future trajectories and provide actionable insights for research, practice, and policy.

The significance of this study lies in its potential to systematically structure an otherwise fragmented body of knowledge, providing a comprehensive overview of a rapidly evolving field. By integrating bibliometric insights with educational theory, this paper contributes to both academic literature and practical application. First, it equips researchers with a roadmap of

influential works, emergent themes, and methodological pathways. Second, it enables educators and curriculum designers to identify evidence-based strategies for integrating media education into critical thinking instruction. Third, it supports policymakers in recognizing global trends and prioritizing investment in areas that enhance media literacy and civic resilience. In an era marked by algorithmic influence, information overload, and epistemic polarization, fostering critical media competence is not merely an academic imperative but a societal necessity.

Media Education Historical and Theoretical Overview: Media education has undergone a significant transformation since the 20th century, evolving from a focus on passive content consumption to active, critical engagement with digital media. The theoretical foundations of media education are closely aligned with concepts such as media literacy, digital literacy, and more recently, multiliteracies (Buckingham, 2003; Livingstone, 2004). Media literacy emphasizes the ability to access, analyze, evaluate, and create media messages in a variety of forms. This literacy is not merely technical; it is deeply critical and reflective, encouraging learners to interrogate media's influence on ideologies, identities, and power structures (Potter, 2010). The shift from traditional literacy toward digital literacy has been catalyzed by the expansion of the internet and mobile technologies. Digital literacy integrates critical thinking with the ability to navigate, evaluate, and create information across digital platforms (Ng, 2012). Building on these literacies, media education is framed as both a field of study and a pedagogical practice, encompassing theoretical models like Buckingham's framework of critical media education, which focuses on representation, language, audience, and production (Buckingham, 2007).

Global frameworks have been instrumental in shaping how media education is conceptualized and implemented. The UNESCO Media and Information Literacy (MIL) framework, launched in 2011, explicitly links media competencies with civic engagement, intercultural dialogue, and lifelong learning. UNESCO's approach promotes a unified vision of media and information literacy that includes traditional, digital, and news literacies (Gendina, 2016). Similarly, the European Commission's Digital Competence Framework (DigComp) defines a set of competencies such as information and data literacy, digital content creation, and problem-solving, integrating media education into digital citizenship (Carretero et al., 2017). The convergence of these global frameworks illustrates a growing consensus: media education must be critical, participatory, and responsive to evolving technologies. This theoretical foundation lays the groundwork for exploring how media education supports broader cognitive and civic outcomes, particularly critical thinking.

Critical Thinking in Education: Critical thinking is widely recognized as one of the most essential competencies for the 21st century. Broadly defined as the ability to analyze, evaluate, and synthesize information for reasoned judgment and decision-making, it forms the cornerstone of educational goals across national curricula and international frameworks (Facione, 1990; Ennis, 2011). The concept of critical thinking is normally connected with higher-order thinking skills and viewed as a requirement of lifelong learning and democratic participation in the process of education research. A number of pedagogical models have developed in order to incorporate critical thinking in education. The model of critical thinking (Paul, Elder, 2006) focuses on intellectual standards (clarity, accuracy, relevance) and aspects of reasoning (purpose, evidence, assumptions) as a systematic approach to teaching and evaluating critical thinking. Another approach, proposed by Halpern (Halpern, 2013), focuses on teaching both the dispositional and cognitive aspects of thinking, encouraging students to want to think critically, and equipping them with the tools to do so.

Assessment of critical thinking has also advanced, with tools such as the California Critical Thinking Skills Test (CCTST) and the Watson-Glaser Critical Thinking Appraisal being used to evaluate students' reasoning abilities in diverse contexts (Stedman, Andenoro, 2007). Moreover, the integration of critical thinking into OECD's Learning Compass 2030 and UNESCO's Global Citizenship Education (GCED) framework underscores its value not just for employability, but for navigating increasingly complex socio-political environments (OECD, 2019). Yet despite its inclusion in curricular policies, research highlights a persistent gap between aspirations and practice. Educators often struggle to translate theoretical models into classroom strategies, particularly in the absence of critical pedagogical training (Zohar, Barzilai, 2013). This underscores the importance of interdisciplinary integration, particularly with fields like media education that naturally lend themselves to inquiry, analysis, and reflection.

Connecting Media Education and Critical Thinking: The convergence of media education and critical thinking is both instinctive and backed by research. Acquiring media literacy naturally compels students to assess the reliability, purpose, and partiality of media messages, which aligns closely with critical thinking skills (Kahne, Bowyer, 2016). In an era where media landscapes are increasingly interactive and governed by algorithms, the capacity to analyze digital information critically transcends academic importance; it also holds civic and moral significance (Mihailidis, Thevenin, 2013). Empirical studies show that media education interventions can enhance critical thinking in diverse populations.

For instance, Martens and Hobbs (Martens, Hobbs, 2015) found that integrating media analysis into high school curricula improved students' reasoning about evidence and argumentation. Similarly, a study by Ashley et al. (Ashley et al., 2017) showed that media literacy education increased adolescents' skepticism toward misinformation and deepened their understanding of evidence-based reasoning. From a cognitive perspective, media education activates evaluative thinking through processes such as content deconstruction, source triangulation, and perspective-taking, cognitive tasks central to critical thinking models (Fisher, 2011). Meanwhile, socio-cultural theorists argue that media literacy fosters critical consciousness by situating learning within real-world, culturally relevant media contexts (Freire, 1970; Mihailidis, Viotty, 2017). This dual lens, cognitive and socio-cultural, positions media education as a unique conduit for cultivating critical thinkers. Despite this promise, the relationship between media education and critical thinking remains under-theorized and under-explored at scale. Much of the existing research is localized, context-specific, and qualitative. A comprehensive synthesis of the field, especially across time and geography, is needed to clarify patterns, gaps, and opportunities.

Previous Bibliometric Reviews: Bibliometric reviews have gained prominence as a way to map scholarly development, especially in interdisciplinary domains. Within the field of media literacy, several bibliometric studies have examined its evolution. For example, Vuojärvi et al. (Vuojärvi et al., 2021) conducted a systematic review of empirical media literacy studies, noting the growing diversification of themes but also the dominance of research from the Global North. Similarly, Wang, Si (Wang, Si, 2023) conducted a bibliometric analysis of media literacy and digital competence, identifying core clusters such as digital safety, teacher training, and civic engagement. In the domain of critical thinking, bibliometric research has been more limited. Engel et al. (Engel et al., 2019) analyzed publications on critical thinking in education, revealing a recent surge in interest driven by global competency frameworks. They emphasized the need for cross-national collaboration and longitudinal studies to advance the field.

Yet to date, there exists no bibliometric study that systematically analyzes the intersection of media education and critical thinking. This absence is striking, given the increasing interdependence of digital engagement and reflective reasoning in educational policy and practice. A bibliometric mapping that spans two decades can illuminate how these two literacies have co-developed, where scholarly attention is concentrated, and what areas remain underexplored. Such analysis is especially valuable in a time of disinformation, polarized media, and AI-generated content, phenomena that challenge the very foundations of both media literacy and critical thinking.

2. Materials and methods

This study employs a bibliometric analysis to map the evolution, structure, and thematic development of research at the intersection of media education and critical thinking skills between 1996 and 2025. Bibliometric techniques provide quantitative insights into publication trends, influential contributors, collaboration networks, and emerging research themes, making them especially valuable in systematically underexplored interdisciplinary fields like this one.

Data Source: The bibliometric data for this research was retrieved exclusively from the Web of Science Core Collection (WoS-CC). This database was selected for several reasons. First, WoS is widely regarded for its comprehensive indexing of peer-reviewed scholarly literature, especially in the fields of education, communication, and social sciences. It provides rich metadata necessary for advanced bibliometric operations, including author affiliations, keyword indexing, citation data, and reference lists, features that are not uniformly available in other platforms such as Google Scholar or ERIC. Furthermore, WoS allows refined filtering by document type, language, publication year, and disciplinary area, making it ideal for targeted bibliometric mapping. The selected timespan for this study is 1996–2025, encompassing 30 years of research and ensuring coverage of both early digital literacy literature and more recent developments shaped by AI, misinformation, and global education reforms.

Search Strategy: A multi-stage filtering process was applied to develop a robust dataset. The initial search used the following Boolean string:

("media education" OR "media literacy education") AND ("critical thinking skills" OR "media literacy")

This broad query yielded 4,207 records. To refine this for quality and relevance, the following steps were taken:

1. Document Type Filter: Only "Articles" and "Review Articles" were included, excluding conference papers, editorials, and other non-peer-reviewed content. This step reduced the dataset to 3,313 records.
2. Language Filter: Only studies published in English were retained, bringing the count to 2,780 articles. This ensures accessibility and alignment with widely cited academic work.
3. Disciplinary Filter: Using WoS subject categorization, only articles categorized under Education, Media and Communication, and Social Sciences were retained. This step focused the analysis on the most relevant scholarly domains.
4. Temporal Inclusion: The final dataset spans articles published from 1996 to 2025 (including early foundational works and in-press 2025 publications, due to early online access).

Inclusion/Exclusion Criteria Summary:

– Inclusion: Peer-reviewed articles and reviews; English-language; publication years 1996–2025; subject areas in education, communication, social sciences.

– Exclusion: Editorials, notes, book reviews, conference abstracts, non-English papers, articles from unrelated disciplines (biomedical sciences).

Analytical Methods: The methodology follows two major phases: performance analysis and science mapping, using established bibliometric techniques.

Performance Analysis: This involves descriptive statistics of the publication dataset to evaluate the productivity and impact of authors, journals, institutions, and countries. Key indicators analyzed include:

– *Annual Scientific Production:* Tracks the number of publications per year, revealing growth trends and inflection points in research interest.

– *Authors and Co-authors:* Measures author productivity, single author vs. collaborative works, and author networks.

– *Citation Analysis:* Assesses the most cited documents and authors, providing insight into influential contributions.

– *Source Analysis:* Identifies key journals that have consistently been published in this domain.

– *Geographic Distribution:* Highlights the leading countries and institutions by publication count and citations.

These metrics help answer research questions regarding the temporal and geographic development of the field.

Science Mapping: This advanced phase investigates the intellectual, conceptual, and social structure of the research field through network analysis:

– *Co-authorship Analysis:* Visualizes collaborative networks among authors and countries, uncovering research hubs and international partnerships.

– *Co-word Analysis:* Maps keyword co-occurrences to identify conceptual clusters and thematic patterns in the literature.

– *Co-citation Analysis:* Reveals the intellectual structure by examining which authors and documents are most frequently cited together.

– *Thematic Evolution Mapping:* Tracks how core topics evolve across time intervals, highlighting emerging, motor, and declining themes through thematic maps.

The objective is not only to quantify scholarly output but to surface underlying dynamics and research fronts.

Software Tools: All analyses were conducted using the Bibliometrix R package (Aria, Cuccurullo, 2017) and its web-based graphical interface, Biblioshiny. This toolset was selected for its comprehensive integration of performance and science mapping functions and its proven use in peer-reviewed bibliometric studies. Key features include:

– Import of WoS BibTeX files

– Network visualization (author co-citation, keyword clusters)

– Statistical output of growth trends, H-index metrics

– Dynamic thematic mapping by time slices

Using Biblioshiny enabled both quantitative metrics and visualizations such as collaboration networks and conceptual maps, ensuring rigor and interpretability.

Ethical Considerations: This study utilized secondary bibliographic data from the Web of Science, a publicly accessible database available through institutional subscription. As no human participants were involved, ethical approval was not required. All analyses complied with responsible research and data-management standards.

3. Discussion

The bibliometric analysis revealed two major thematic clusters: one centered on Media Literacy in K–12 education and the other on Digital Critical Pedagogy. Cluster A predominantly focuses on the role of media literacy as a foundational skill in early education. It emphasizes developing students' ability to analyze, evaluate, and create media messages, which is vital in an age of information overload and misinformation (Buckingham, 2003; Hobbs, 2011). This cluster reflects educational practices integrating media analysis in school curricula and highlights empirical studies that assess outcomes in student engagement and critical thinking. Meanwhile, Cluster B illustrates the emergence of Digital Critical Pedagogy, a theme that intersects media literacy with critical theory, emphasizing student agency, reflexivity, and social justice in digital learning environments (Kellner, Share, 2005). This thematic group includes studies that critique dominant narratives, explore algorithmic biases, and empower learners to question digital power structures, echoing the work of Freirean pedagogy adapted for digital contexts.

Trends and Gaps: Recent trends indicate a substantial increase in literature focused on misinformation, digital platforms, and adolescents' media behavior. This reflects growing concerns over fake news and online safety, particularly during political events and public health crises such as COVID-19 (Tully et al., 2020; Vraga, Tully, 2021). However, several gaps remain. First, there is a noticeable underrepresentation of research from the Global South, including Africa, Southeast Asia, and Latin America. Most publications stem from Western countries, especially the United States, the UK, and Australia, suggesting an imbalance in global knowledge production and a lack of culturally relevant media literacy approaches for non-Western populations (Cortes, 2020; Mihailidis, Viotty, 2017). Second, intervention-based studies often lack rigorous empirical validation. While many theoretical or descriptive papers propose pedagogical strategies, fewer studies offer longitudinal data or controlled experiments to assess the effectiveness of media literacy interventions (Jeong et al., 2012; McDougall et al., 2018).

Integration with Previous Literature: This study's thematic mapping generally aligns with earlier literature on media literacy, confirming that traditional concerns, such as critical viewing, message construction, and advertising literacy, remain relevant (Potter, 2010). However, it also demonstrates a shift towards newer paradigms that emphasize platform literacy, algorithmic awareness, and civic reasoning. For instance, while D. Buckingham (Buckingham, 2003) focused on media education as a way to navigate traditional mass media, current literature integrates digital participatory cultures and the influence of social media algorithms (Livingstone, 2004). This reflects both convergence and evolution in the field: foundational skills in critical analysis persist, but they are now applied to new media environments with more complex socio-technical dynamics.

Implications: Thematically, this bibliometric mapping supports the evolution of media literacy from a basic functional skill set towards a critical and reflexive framework. It reinforces theories that consider media literacy a multidimensional construct encompassing cognitive, emotional, and socio-political competencies. Furthermore, the emergence of clusters around misinformation and digital pedagogy highlights the theoretical shift towards critical digital literacy, a concept that merges Freirean critical pedagogy with 21st-century digital realities (Kellner, Share, 2005). At the same time, the current literature challenges earlier education models that view media literacy primarily through a protectionist lens (i.e., shielding youth from harmful media). Instead, it promotes empowering models that prepare learners to actively and ethically engage in media production and discourse (Hobbs, Jensen, 2009). These developments suggest a maturation of the field, pointing toward frameworks that are both critically robust and adaptable to evolving digital ecologies.

4. Results

The data analysis for this study was conducted using a comprehensive bibliometric approach, drawing on a curated dataset of 2,376 peer-reviewed articles published between 1996 and 2025. These records were retrieved from the Web of Science Core Collection, following rigorous filtering

based on document type (articles), language (English), and disciplinary relevance (education, media and communication, and social sciences). Utilizing the Bibliometrix package in R and its Biblioshiny interface, the analysis focused on both performance indicators (such as annual scientific production, most cited documents, prolific authors, and leading journals) and science mapping techniques (including co-authorship, keyword co-occurrence, co-citation analysis, and thematic evolution). The objective was to uncover patterns in scholarly output, trace the intellectual and social structures of the field, and identify emerging areas of research linking media education and critical thinking. The findings presented in this section offer quantitative insights into the dynamics, growth, and gaps in this interdisciplinary research domain over the past three decades.

Annual Scientific Production: Figure 1 shows a clear upward trend in annual scientific production on media education and critical thinking from 1996 to 2025. Research output remained low until 2010 but began increasing steadily afterward. A sharp rise is visible from 2015, with significant growth peaking in 2025, with over 400 articles. This surge reflects growing global emphasis on digital literacy, critical thinking, and media education. The rise aligns with policy efforts like UNESCO's Media and Information Literacy frameworks. This growth also suggests the academic community's response to challenges like misinformation, digital citizenship, and education reform. The increasing volume of research signifies that the intersection of media education and critical thinking is becoming a well-recognized and rapidly developing area of study.

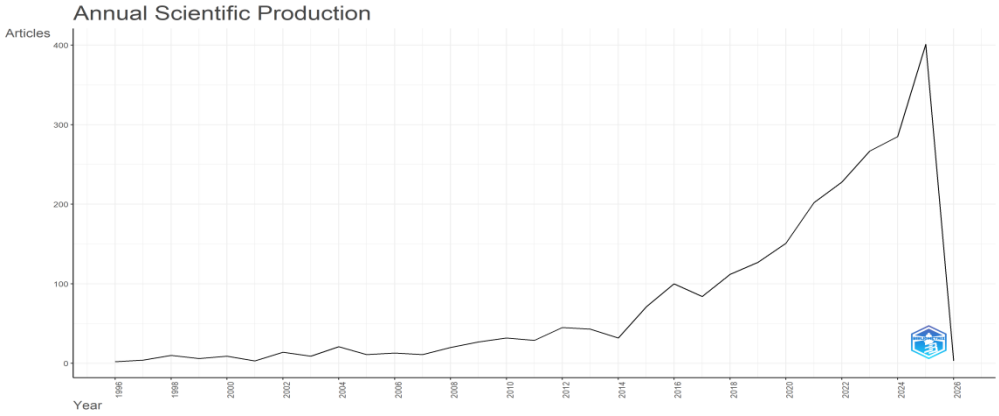

Fig. 1. Annual Scientific Production

Average Citations per Year: Figure 2 illustrates the average number of citations received per article published each year between 1996 and 2025. The trend is notably fluctuating, indicating variations in the long-term impact of publications over time. Peaks can be observed in 2003, 2007, and 2012–2013, where articles published in those years received higher average citations. This suggests the presence of highly influential studies or a smaller volume of publications with broader reach during those years.

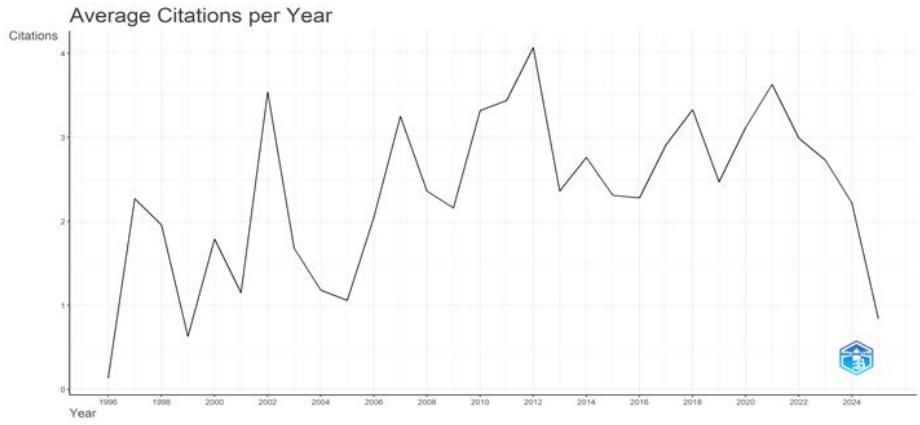

Fig. 2. Average Citations per Year

From 2017 to 2021, citation averages remained relatively high and stable, reflecting increased scholarly attention and citation activity in the field. However, there is a clear decline in the years 2024 and especially 2025. This drop is expected, as recent publications have had limited time to accumulate citations. Overall, the pattern suggests that older publications have had more time to influence academic discourse, while newer ones may still be gaining visibility.

Three-Field Plot (CR–AU–KW): Figure 3 presents a three-field plot connecting three key bibliometric dimensions: Cited References (CR), Authors (AU), and Keywords (KW). It illustrates the intellectual structure of the field by showing how frequently cited works (left), influential authors (middle), and dominant research themes (right) interrelate. Prominent cited works include seminal contributions by D. Buckinham (Buckingham, 2003) and R. Hobbs (Hobbs, 2011), indicating their foundational role in shaping discourse around media literacy and education. Influential authors such as A. Fedorov and A. Levitskaya (Fedorov, Levitskaya, 2015, etc), M. Tully (Tully et al., 2020, etc.) are positioned centrally, demonstrating high connectivity with both the cited literature and thematic keywords.

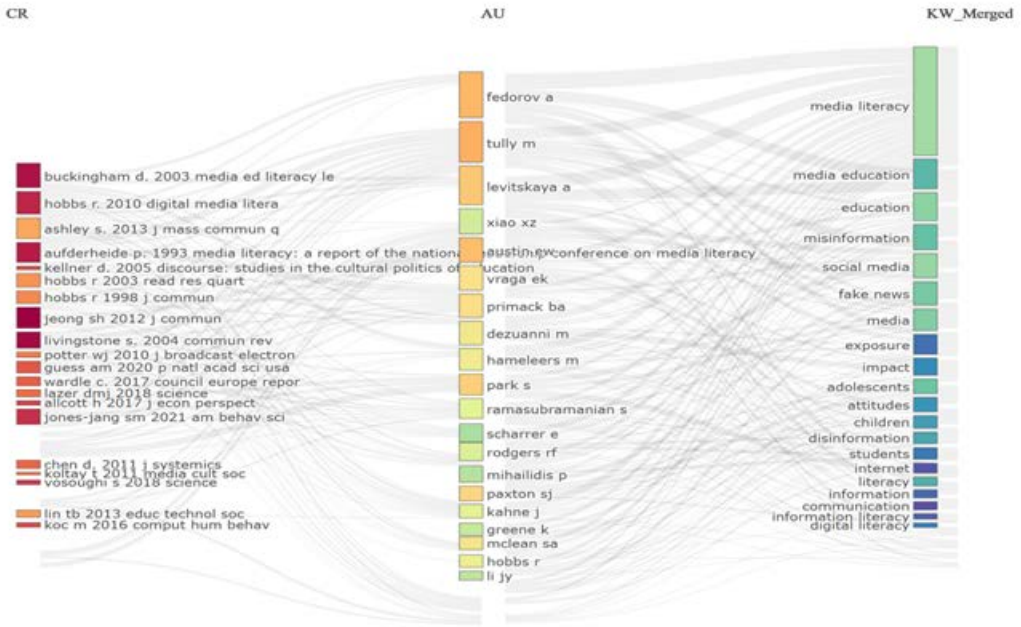

Fig. 3. Three-Field Plot

On the keyword side, dominant terms like media literacy, media education, education, and misinformation highlight the thematic focus of the research landscape. The linkage between authors and keywords reveals that contemporary research is increasingly addressing the intersection of media use, critical thinking, and digital challenges like fake news and disinformation, especially among adolescents and students.

Most Relevant Sources: Figure 4 displays the most relevant academic sources publishing research on media education and critical thinking. The journal *Media Education–Mediaobrazovanie* leads significantly with 73 publications, indicating its central role in this scholarly domain. It is followed by *Comunicar* (44 documents) and *Media and Communication* (41 documents), both of which are well-known for addressing interdisciplinary themes in education, media, and society. Other prominent journals include *Body Image* (37), *Media Literacy and Academic Research* (34), and International *Journal of Communication* (33), showcasing a diverse range of perspectives from psychology, communication, and educational research. Journals like *Journal of Children and Media*, *New Media & Society*, and *American Behavioral Scientist* further emphasize the field's relevance to both youth-oriented studies and social behavior.

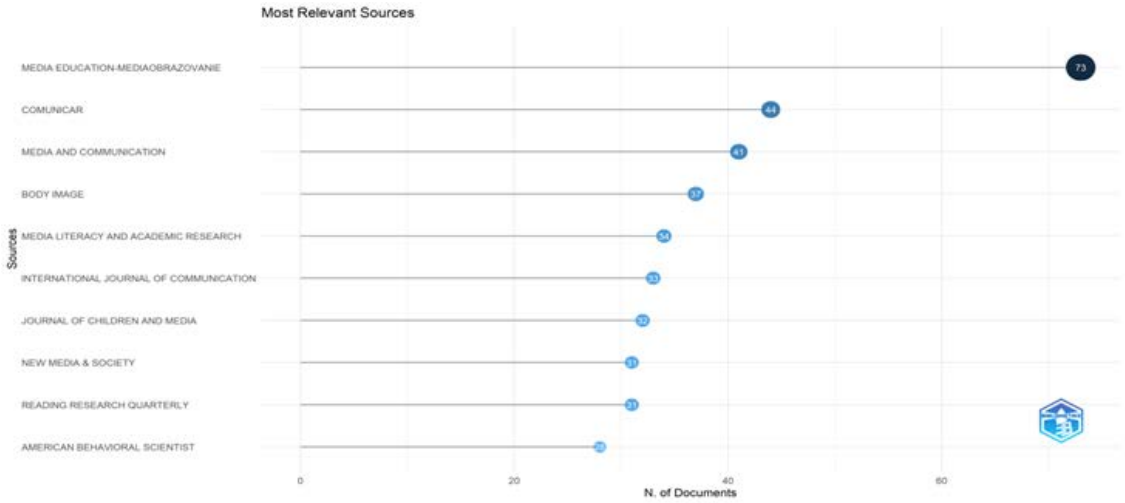

Fig. 4. Most Relevant Sources

This distribution highlights the interdisciplinary nature of the topic and shows that research is being published across journals focused on media studies, communication, education, and behavioral science. These outlets collectively shape the discourse on how media education supports the development of critical thinking skills.

Authors' Production Over Time: Figure 5 visualizes the publication activity of leading authors in the field of media education and critical thinking over time. Each bubble represents the number of articles published in a given year, with larger and darker bubbles indicating more articles and higher citation impact (TC per year).

M. Tully shows strong and consistent output from 2015 onward, peaking in recent years, which explains their top position in total publications. A. Fedorov also demonstrates steady contributions, with impactful work between 2015 and 2022. E.W. Austin has the longest publishing timeline, beginning in the late 1990s, and sustained contributions up to 2024. A. Levitskaya and S. Park show steady output from 2015 onward, while SJ. Paxton and B.A. Primack had earlier spikes, particularly around 2017–2019.

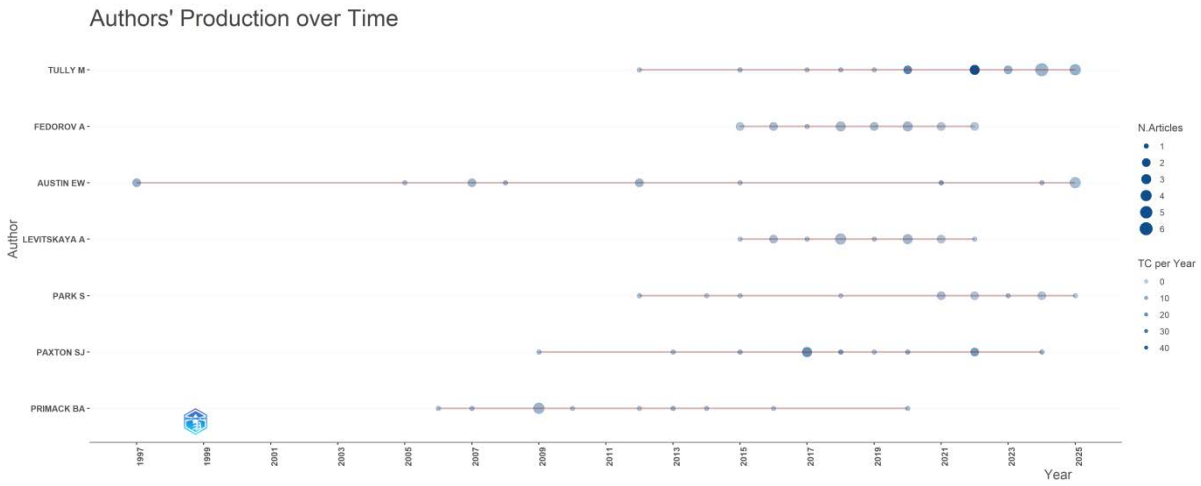

Fig.5. Authors' Production over Time

Corresponding Author's Countries: Figure 6 depicts the geographic distribution of corresponding authors in the field of media education and critical thinking research.

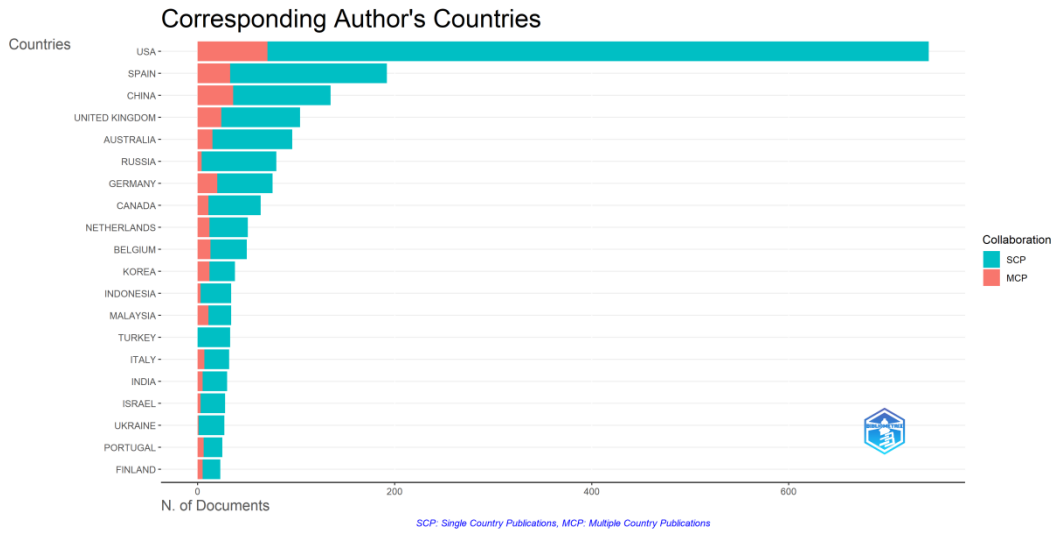

Fig. 6. Corresponding Author's Countries

The United States overwhelmingly leads the field with the highest number of publications, primarily through Single Country Publications (SCP), indicating a dominant national research presence. Spain and China follow as the second and third most productive countries, showing a healthy balance between SCP and Multiple Country Publications (MCP), suggesting both strong internal output and international collaboration. The United Kingdom, Australia, and Russia also display notable activity, reflecting the global relevance of the topic.

European countries like Germany, Belgium, the Netherlands, and Finland, as well as Asian nations such as South Korea, Indonesia, Malaysia, and India, contribute to the field but with fewer collaborative works, as indicated by the relatively smaller MCP segments. Largely, the figure illustrates a broad international interest in media literacy and critical thinking, with the U.S. as the epicenter, but growing research engagement across Europe and Asia as well.

Country Production Over Time: Figure 7 illustrates the cumulative scholarly output on media education and critical thinking from five leading countries, the USA, China, Spain, the United Kingdom, and Australia, from 1995 to 2025. The United States clearly dominates in terms of total article production, showing a steep and continuous growth curve, especially after 2015, and peaking sharply after 2020. China and Spain also demonstrate a notable increase in research activity beginning around 2018, with China surpassing the UK and Australia in total output. The United Kingdom and Australia, while contributing consistently, maintain comparatively moderate growth rates throughout the period. This trend reflects the growing international engagement in media education and critical thinking research, with developing nations like China rapidly increasing their contributions, while the U.S. continues to maintain a stronghold in the field. The graph underscores the shift towards global scholarly involvement over time.

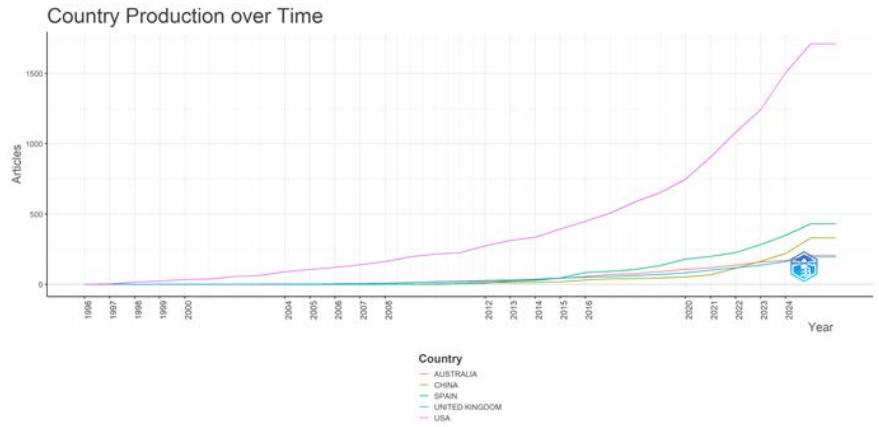

Fig. 7. Country Production Over Time

Tree Map of Most Frequent Keywords: Figure 8 presents a tree map visualization of the most relevant keywords used in research on media education and critical thinking. The largest segment is "media literacy" with 1,061 occurrences, representing 19 % of all keywords, which confirms its dominant position in literature.

Other frequently used terms include "social media" (287, 5 %), "education" (242, 4 %), "media" (240, 4 %), "fake news" (191, 3 %), and "adolescents" (176, 3%). These keywords highlight the main thematic focus areas, how media literacy is taught and developed, especially among youth, and the challenges posed by misinformation. Keywords such as "misinformation", "media education", "digital literacy", "students", and "internet" suggest an educational and digital context, while others like "attitudes", "behavior", "impact", and "exposure" point toward psychological and social implications of media use. Largely, this tree map provides a compact overview of keyword prevalence and thematic distribution, illustrating the field's interdisciplinary nature and the prominence of issues like misinformation, youth engagement, and education in the digital age.

Fig. 8. Tree map

Trend Topics Over Time: Figure 9 illustrates the evolution of trending research topics in media literacy and related fields from 2013 to 2025. The terms are plotted based on their time of appearance and frequency, represented by the size of the bubbles. "Media literacy" remains the most consistently discussed topic, appearing heavily between 2018 and 2021 with the largest bubble, indicating high frequency. Other enduring themes include "education", "media", and "adolescents", showing steady academic interest across multiple years. More recent and fast-growing topics such as "misinformation", "disinformation", "fake news", and "social media" have emerged prominently after 2020, indicating a shift in focus toward digital threats and the critical evaluation of information in online spaces.

Additionally, concepts like "digital literacy", "communication", "information literacy", and "technology" have gained traction in the last few years, reflecting the growing relevance of digital platforms in education and information consumption. The figure shows a clear transition from traditional themes like television and gender (pre-2018) to contemporary concerns around digital media, misinformation, and youth engagement in the digital age.

Clusters by Document Coupling: Figure 10 illustrates clusters derived from document coupling, highlighting how closely research topics are connected based on shared references. The x-axis represents centrality, indicating how interconnected a topic is within the research field, while the y-axis shows impact, reflecting its influence in literature. The map reveals two distinct clusters. The first cluster, located in the upper-right quadrant, includes “media literacy,” “fake news,” and

"misinformation," with high confidence levels, most notably, "misinformation" (93.9 %) and "fake news" (92.5 %). These topics are both highly central and impactful, indicating their dominant role and wide scholarly attention in the research landscape.

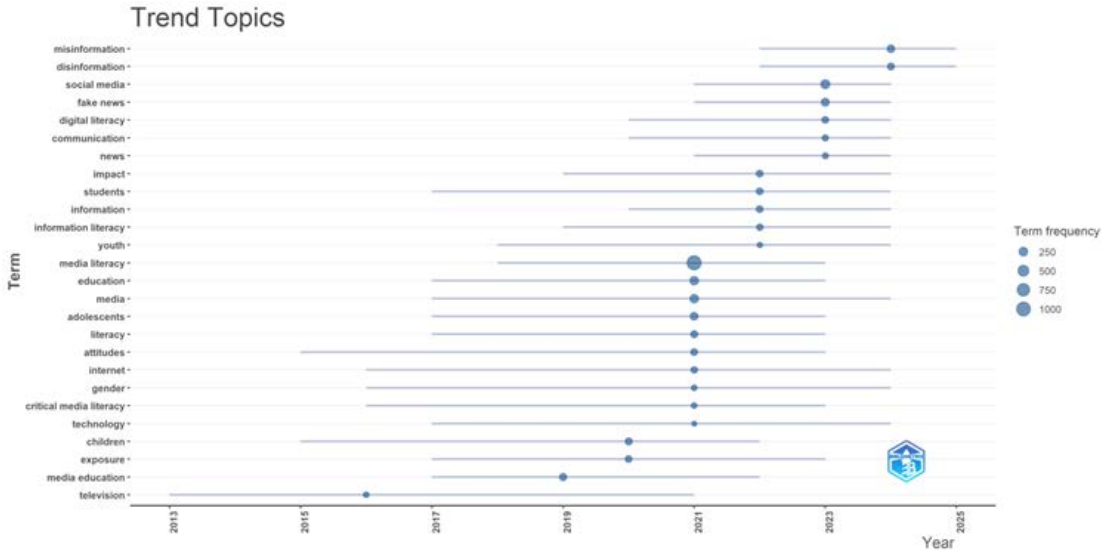

Fig. 9. Trend Topics

In contrast, the second cluster in the lower-left quadrant comprises "social media," "digital literacy," and another form of "media literacy." These topics have lower centrality and impact, suggesting they are either emerging themes or represent more niche or context-specific research that is not yet fully integrated into the broader discourse. Largely, the figure emphasizes the pivotal role of misinformation-related studies within media literacy, positioning them as core themes driving current academic inquiry.

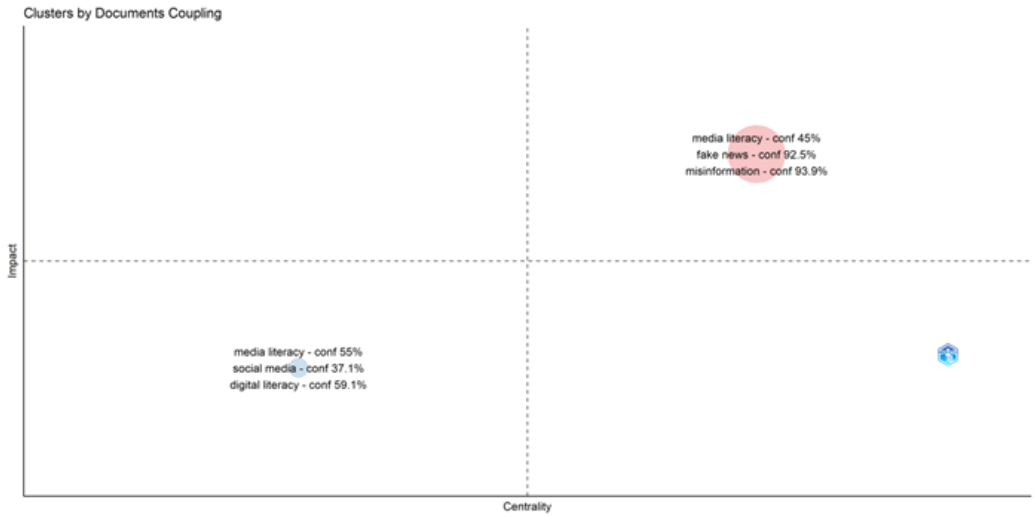

Fig. 10. Cluster by Document Coupling

Collaboration Network Among Authors: Figure 11 presents a collaboration network among authors, where nodes represent individual researchers and connecting lines indicate co-authorship relationships. The size of each node reflects the number of publications, while the thickness of the links shows the strength or frequency of collaboration. The most prominent clusters are centered around authors such as E.W. Austin, M. Tully, and S.J. Paxton, indicating they are leading figures with extensive co-authorship networks. E.W. Austin, with the largest node, appears to be the most active and well-connected researcher, working closely with others like S.J.T. Hust and B.E. Pinkleton. Similarly, M. Tully shows a strong collaboration with E.K. Vraga, suggesting a

tightly-knit research partnership. Paxton SJ also forms a notable cluster with S.A. Mclean and S.M. Wilksch, representing another active research group. Largely, the figure highlights the collaborative nature of scholarly work in this field, identifying both core contributors and the structure of research communities through co-authorship patterns.

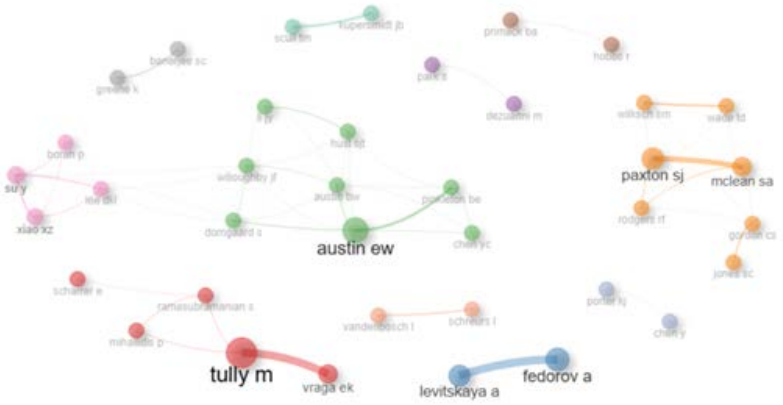

Fig. 11. Collaboration Network Among Authors

World Map Collaboration: Figure 12 and data from the world map collaboration visualization illustrate the global research collaborations in the field. The visual map highlights strong international connections, especially involving the USA, which appears to be the central hub of scholarly collaboration. The USA has established numerous bilateral partnerships with countries such as Australia, China, the United Kingdom, and several European nations. These collaborations are shown by thick connecting lines, indicating high frequencies of co-authored publications.

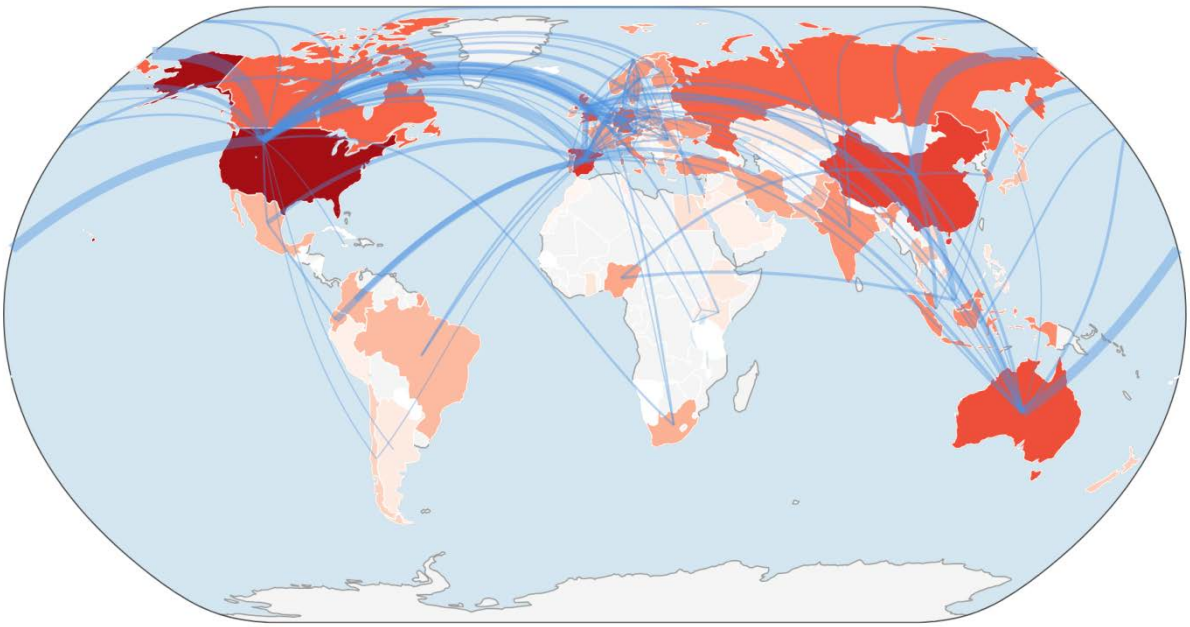

Fig. 12. World Map Collaboration

The accompanying data table confirms this, showing detailed frequencies of collaboration between specific countries. For example, Australia has frequent partnerships with countries like Canada and China. This visualization reflects the interconnectedness of the academic community and underscores the dominance of a few core countries in shaping global research in the area of study. The darker shades and thicker lines on the map emphasize the more active contributors,

reinforcing how certain nations significantly influence knowledge production through robust international collaboration networks.

5. Conclusion

This bibliometric analysis provides a comprehensive overview of the evolving landscape of media literacy research. The findings reveal a growing but fragmented field, with significant thematic concentrations around topics such as media literacy education, misinformation, digital pedagogy, and social media engagement. While the volume of publications has increased substantially in recent years, the field lacks cohesive integration between cognitive and pedagogical strands. Much of the research remains siloed, with theoretical and empirical studies often disconnected. This underscores the need for more unified frameworks that combine educational theory with practical interventions and media analysis. To advance the field, future work should prioritize interdisciplinary and cross-cultural studies that bridge media studies, education, psychology, and communication. Researchers are encouraged to extend bibliometric insights into tangible applications, such as curriculum development and teacher training programs. Doing so can foster pedagogical innovation and ensure that media literacy education is responsive to diverse cultural and technological contexts. Moreover, studies should seek to include underrepresented regions and non-English literature to broaden the global scope of inquiry and avoid Western-centric perspectives.

Several limitations affect the present analysis. The study relied on specific databases, which may exclude relevant work from smaller journals or grey literature. Language bias is another concern, as English-language publications often dominate bibliometric databases, potentially marginalizing research conducted in languages other than English. Additionally, citations, especially for recently published works, can skew the perceived impact and relevance of emerging topics.

Looking ahead, future research should include experimental studies to validate the themes identified in bibliometric mapping. There is also value in conducting mixed-methods syntheses that incorporate qualitative insights to contextualize quantitative trends. Such approaches may enrich our understanding of how media literacy is taught, perceived, and practiced across different educational and cultural environments, ultimately contributing to a more holistic and impactful research agenda.

References

Aria, Cuccurullo, 2017 – *Aria, M., Cuccurullo, C.* (2017). Bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*. 11(4): 959-975. DOI: https://doi.org/10.1016/j.joi.2017.08.007

Ashley et al., 2017 – *Ashley, S., Maksl, A., Craft, S.* (2017). News media literacy and political engagement: What's the connection? *Journal of Media Literacy Education*. 9(1): 79-98. [Electronic resource]. URL: https://eric.ed.gov/?id=EJ1151035

Buckingham, 2003 – *Buckingham, D.* (2003). Media education: Literacy, learning and contemporary culture. Polity Press.

Buckingham, 2007 – *Buckingham, D.* (2007). Digital media literacies: Rethinking media education in the age of the Internet. *Research in Comparative and International Education*. 2(1): 43-55. DOI: https://doi.org/10.2304/rcie.2007.2.1.43

Carretero et al., 2017 – *Carretero, S., Vuorikari, R., Punie, Y.* (2017). *DigComp 2.1.* The Digital Competence Framework for Citizens. With eight proficiency levels and examples of use. Publications Office of the European Union.

Cortes, 2020 – *Cortes, R.Z.* (2020). A critical evaluation of Clifford Christians's media ethics theory: a précis. Church Communication and Culture. 5(2): 157-186. DOI: https://doi.org/10.1080/23753234.2020.1765694

Donthu et al., 2021 – *Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., Lim, W.M.* (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, 133: 285-296. DOI: https://doi.org/10.1016/j.jbusres.2021.04.070

Engel et al., 2019 – *Engel, L.C., Rutkowski, D., Thompson, G. (*2019). Toward an international measure of global competence? A critical look at the PISA 2018 framework. *Globalisation Societies and Education*. 17(2): 117-131. DOI: https://doi.org/10.1080/14767724.2019.1642183

Ennis, 2011 – *Ennis, R.* (2011). Critical thinking: Reflection and perspective Part II. *Inquiry Critical Thinking Across the Disciplines*. 26(2): 5-19. DOI: https://doi.org/10.5840/inquiryctnews 201126215

Facione, 1990 – *Facione, P.* (1990). Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction (The Delphi Report).

Facione, 2011 – *Facione, P.A.* (2011). Critical thinking: What it is and why it counts. *Insight assessment*. 1(1): 1-23.

Fedorov, Levitskaya, 2015 – *Fedorov, A., Levitskaya, A.* (2015). The Framework of media education and media criticism in the contemporary world: the opinion of international experts. *Comunicar*. 45(23): 107-115. DOI: 10.3916/C45-2015-11

Fisher, 2011 – *Fisher, R. M.* (2011). A critique of critical thinking: Towards a critical integral pedagogy of fearlessness. *NUML Journal of Critical Inquiry*. 9(2): 92.

Freire, 1970 – *Freire, P.* (1970). The adult literacy process as cultural action for freedom. *Harvard educational review*. 40(2): 205-225.

Gendina, 2016 – *Gendina, N.* (2016). Integrating the Personal Information Culture concept and the idea of media and information literacy offered in the UNESCO curriculum for Teachers: Experiences of Russia and Uzbekistan. In: *Communications in computer and information science* (pp. 543–554). Cham: Springer International Publishing. DOI: https://doi.org/10.1007/978-3-319-52162-6_54

Grizzle et al., 2014 – *Grizzle, A., Moore, P., Dezuanni, M., Asthana, S., Wilson, C., Banda, F., Onumah, C.* (2014). Media and information literacy: policy and strategy guidelines. UNESCO.

Halpern, 2013 – *Halpern, D.F.* (2013). Thought and knowledge: An introduction to critical thinking. Psychology press.

Hobbs, 2011 – *Hobbs, R.* (2011). Digital and media literacy: Connecting culture and classroom. Corwin Press.

Hobbs, Jensen, 2009 – *Hobbs, R., Jensen, A.* (2009). The past, present, and future of media literacy education. *Journal of Media Literacy Education*. 1(1): 1-11. DOI: https://doi.org/10.23860/jmle-1-1-1

Jeong et al., 2012 – *Jeong, S.H., Cho, H., Hwang, Y.* (2012). Media literacy interventions: A meta-analytic review. *Journal of Communication*. 62(3): 454-472. DOI: https://doi.org/10.1111/j.1460-2466.2012.01643.x

Kahne, Bowyer, 2016 – *Kahne, J., Bowyer, B.* (2016). Educating for democracy in a partisan age. *American Educational Research Journal.* 54(1): 3-34. DOI: https://doi.org/10.3102/0002831216679817

Kellner, Share, 2005 – *Kellner, D., Share, J.* (2005). Toward critical media literacy: core concepts, debates, organizations, and policy. *Discourse Studies in the Cultural Politics of Education*. 26(3): 369-386. DOI: https://doi.org/10.1080/01596300500200169

Livingstone, 2004 – *Livingstone, S.* (2004). Media literacy and the challenge of new information and communication technologies. *The Communication Review*. 7(1): 3-14. DOI: https://doi.org/10.1080/10714420490280152

Martens, Hobbs, 2015 – *Martens, H., Hobbs, R.* (2015). How media literacy supports civic engagement in a digital Age. *Atlantic Journal of Communication*. 23(2): 120-137. DOI: https://doi.org/10.1080/15456870.2014.961636

McDougall et al., 2018 – *McDougall, J., Zezulkova, M., Van Driel, B., Sternadel, D.* (2018). Teaching media literacy in Europe: evidence of effective school practices in primary and secondary education, NESET II report.

Mihailidis, Thevenin, 2013 – *Mihailidis, P., Thevenin, B.* (2013). Media literacy as a core competency for engaged citizenship in participatory democracy. *American Behavioral Scientist*. 57(11): 1611-1622. DOI: https://doi.org/10.1177/0002764213489015

Mihailidis, Viotty, 2017 – *Mihailidis, P., Viotty, S.* (2017). Spreadable spectacle in digital culture: civic expression, fake news, and the role of media literacies in "Post-Fact" society. *American Behavioral Scientist*. 61(4): 441-454. DOI: https://doi.org/10.1177/0002764217701217

Ng, 2012 – *Ng, W.* (2012). Can we teach digital natives digital literacy? *Computers & Education*. 59(3): 1065-1078. DOI: https://doi.org/10.1016/j.compedu.2012.04.016

OECD, 2019 – OECD. An OECD learning framework 2030. In*: The future of education and labor*. 2019. Cham: Springer International Publishing: 23-35.

Paul, Elder, 2006 – *Paul, R., Elder, L.* (2006). Critical thinking competency standards. Dillon Beach: Foundation for critical thinking.

Potter, 2010 – *Potter, W.J.* (2010). The state of media literacy. *Journal of Broadcasting & Electronic Media*. 54(4): 675-696. DOI: https://doi.org/10.1080/08838151.2011.521462

Stedman, Andenoro, 2007 – *Stedman, N.L., Andenoro, A.C.* (2007). Identification of Relationships between Emotional Intelligence Skill & Critical Thinking Disposition in Undergraduate Leadership Students. *Journal of Leadership Education*. 6(1): 190-208. DOI: https://doi.org/10.12806/v6/i1/rf10

Tommasi et al., 2021 – *Tommasi, F., Ceschi, A., Sartori, R., Gostimir, M., Passaia, G., Genero, S., Belotto, S.* (2021). Enhancing critical thinking and media literacy in the context of IVET: a systematic scoping review. *European Journal of Training and Development*. 47(1/2): 85-104. DOI: https://doi.org/10.1108/ejtd-06-2021-0074

Tully et al., 2020 – *Tully, M., Vraga, E.K., Bode, L.* (2020). Designing and testing news literacy messages for social media. *Mass Communication & Society*. 23(1): 22-46. DOI: https://doi.org/10.1080/15205436.2019.1604970

Vraga, Tully, 2021 – *Vraga, E.K., Tully, M.* (2021). News literacy, social media behaviors, and skepticism toward information on social media. *Information Communication & Society*. 24(2): 150-166. DOI: https://doi.org/10.1080/1369118x.2019.1637445

Vuojärvi et al., 2021 – *Vuojärvi, H., Sirpa Purtilo-Nieminen, Rasi, P., Rivinen, S.* (2021). Conceptions of adult education teachers-in-training regarding the media literacy education of older people. A phenomenographic study to inform a course design. *Journal of Media Literacy Education*. 13(3): 1-18. DOI: https://doi.org/10.23860/jmle-2021-13-3-1

Wang, Si, 2023 – *Wang, C., Si, L.* (2023). A Bibliometric Analysis of Digital Literacy Research from 1990 to 2022 and Research on Emerging Themes during the COVID-19 Pandemic. *Sustainability*. 15(7): 5769. DOI: https://doi.org/10.3390/su15075769

Zohar, Barzilai, 2013 – *Zohar, A., Barzilai, S.* (2013). A review of research on metacognition in science education: current and future directions. *Studies in Science Education*. 49(2): 121-169. DOI: https://doi.org/10.1080/03057267.2013.847261