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CONTENTS

Combating Misinformation Through Media and Information Literacy: A Case Study Among University Students

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Abstract

In the context of rising misinformation across digital platforms, Media and Information Literacy (MIL) has become an essential educational tool for fostering critical engagement among university students. This study investigates the role of MIL in combating misinformation within a Pakistani university context. Employing a qualitative case study design, the research involved 30 undergraduate students from a public university in Punjab who participated in a two-hour MIL intervention workshop based on UNESCO's curriculum framework. Data were collected through three semi-structured focus group discussions and analyzed thematically using NVivo. Findings revealed four key themes: increased awareness of misinformation tactics, enhanced confidence in source verification, emotional barriers to critical engagement, and a strong student demand for formal MIL curriculum integration. While students demonstrated improved analytical and verification skills, many continued to struggle with confirmation bias and emotional resonance tied to cultural and religious content. The results underscore the importance of embedding MIL into higher education in culturally responsive ways and suggest the need for sustained interdisciplinary instruction. This study contributes to the limited body of empirical MIL research in South Asia and offers practical recommendations for curriculum developers, policymakers, and educators aiming to counter misinformation through structured pedagogical strategies. It also highlights the value of localized, depth-oriented case studies in developing context-sensitive media education frameworks.

Keywords: media and information literacy, misinformation, critical thinking, digital literacy, curriculum development.

1. Introduction

In the digital age, the prevalence of misinformation has become an increasingly critical concern, particularly within academic settings where knowledge production and dissemination are foundational. University students, despite their high levels of digital engagement, are especially vulnerable to consuming and sharing false or misleading information due to limited critical literacy and verification skills (Molina et al., 2025). The viral nature of content shared via social media has exacerbated the challenge, contributing to misinformed behaviors and distorted perceptions of truth. Media and Information Literacy (MIL) has emerged as a pivotal educational response to this crisis. According to UNESCO, MIL encompasses the competencies that enable individuals to engage critically with content, understand the role of media in society, and make informed decisions (Gálik, 2020; Gáliková Tolnaiová, Gálik, 2020; Hurajová, 2025). Within university environments, fostering MIL is not merely a defensive measure against disinformation; it is a foundational aspect of cultivating responsible citizenship and participatory democracy (Madrid-

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Morales, Wasserman, 2025). The challenge lies in embedding MIL effectively into curricula across disciplines and ensuring that pedagogical practices evolve to address the dynamic landscape of digital misinformation.

Recent research underscores the efficacy of MIL interventions in equipping students with the skills to evaluate content credibility and resist manipulative narratives. Studies have shown that students who receive structured MIL education demonstrate improved abilities in recognizing biased sources, verifying online information, and contextualizing digital content (Abuhasirah, Salameh, 2025). However, despite these benefits, the integration of MIL in higher education remains inconsistent, with varying degrees of institutional commitment and pedagogical innovation (Verma et al., 2023). This paper explores the role of Media and Information Literacy in combating misinformation among university students. It investigates how MIL frameworks and practices influence students' critical thinking, media engagement, and digital ethics. Through a synthesis of empirical studies, the research identifies effective pedagogical models and proposes pathways for systemic integration of MIL into university education.

The impact of misinformation on university students is both psychological and epistemological. In a Thai study on Gen Z learners, low levels of digital literacy were linked to increased susceptibility to political misinformation, affecting students' civic engagement and trust in institutions (Taneerat, Dongnadeng, 2024). Similarly, Al-Dossary et al. (Al-Dossary et al., 2024) found that students struggled to identify false health claims on platforms like TikTok, highlighting gaps in their ability to scrutinize digital content even on issues directly related to personal well-being. MIL is not merely a skillset, but a framework rooted in constructivist theories of learning. It supports learners in co-constructing knowledge, questioning sources, and engaging with content through a lens of skepticism and analysis (Valchanov et al., 2025). MIL also integrates critical pedagogy, emphasizing the role of education in promoting agency and consciousness-raising in students' digital experiences. These theoretical underpinnings position MIL as a key strategy in resisting manipulative information flows.

Recent educational interventions have demonstrated that MIL is most effective when embedded into disciplinary content rather than treated as a standalone module. Cooper (Cooper, 2019) describes how the University of Canberra's Counter Misinformation Month engaged students in active media analysis and verification exercises, resulting in measurable improvements in content discernment. Similarly, Yasseri et al. (Yasseri et al., 2022) implemented MIL within a history education framework, using social media examples to promote critical reflection on national narratives and digital memory. Experiential and participatory learning has also proven beneficial. Álvarez-García et al. (Álvarez-García et al., 2025) introduced serious games and simulations into classrooms to build student resilience against fake news. These activities helped learners experience the mechanics of misinformation first-hand and reflect on cognitive biases influencing digital decision-making.

Trust in media is a key variable affecting how students engage with content. Serengga et al. (Serengga et al., 2025) found that students' understanding of health-related misinformation was closely tied to their perceived reliability of the source. In Nigeria, Omoko and Okhueleigbe (Omoko, Okhueleigbe, 2025) identified a paradox: although Generation Z students relied heavily on mediated communication, they simultaneously expressed deep mistrust in the accuracy of online content. MIL interventions must therefore address not only skills but also the emotional and psychological factors underpinning media trust. Empirical data consistently support the benefits of structured MIL education. In Malaysia, Al Zou'bi (Al Zou'bi, 2022) found that students with higher MIL proficiency demonstrated greater accuracy in detecting manipulated news and exhibited lower susceptibility to viral disinformation. In Sweden, a qualitative study by Puleo (Puleo, 2025) revealed that students who engaged in MIL-focused focus groups reported a heightened sense of responsibility in correcting misinformation in their peer networks. Furthermore, MIL initiatives that incorporate ethical reflection, peer collaboration, and scenario-based learning contribute to more sustainable behavioral change among students. These approaches move beyond cognitive processing and into the realm of media ethics and civic responsibility.

2. Materials and methods

This study employed a qualitative case study approach to explore how Media and Information Literacy (MIL) interventions influence the ability of university students in Pakistan to critically engage with online misinformation. The case study method was chosen for its capacity to

offer a rich, contextualized understanding of complex educational phenomena within real-life learning environments (Yin, 2017). The research was conducted at a public sector university in Punjab, Pakistan, where English is used as a medium of instruction. A total of 30 undergraduate students from the departments of Education, Mass Communication, and Islamic Studies voluntarily participated in the study. These students were enrolled in courses that included components of digital media, civic engagement, or media ethics. Participants were selected through purposive sampling, aimed at including students who had experienced both formal and informal exposure to digital content. The selection ensured variation in gender, academic standing, and digital media usage frequency to reflect a diverse cross-section of the student body. Before data collection, participants attended a two-hour workshop on Media and Information Literacy. The workshop was adapted from UNESCO's MIL Curriculum for Teachers (2021) and covered:

– Identifying misinformation and fake news
– Evaluating the credibility of sources
– Understanding media bias and propaganda
– Ethical online behavior

The session included short videos, guided analysis of social media posts, and small-group discussions. Data were collected through three semi-structured focus group discussions (FGDs), each consisting of 8–10 participants. Discussions were guided by a flexible interview protocol, focusing on:

– Students' personal experiences with online misinformation
– Perceived ability to evaluate content critically after the intervention
– Views on the usefulness and relevance of MIL education

Each session lasted between 45–60 minutes, was conducted in English and Urdu, and was audio-recorded with participant consent. Recordings were later transcribed and translated into English for analysis. A thematic analysis was conducted using Braun and Clarke's (Braun, Clarke, 2006) six-step framework. After familiarization with the data, initial codes were generated, and themes were identified and refined. Codes were both inductive (emerging from the data) and deductive (based on the intervention goals). NVivo 12 software was used to assist in organizing and categorizing the data. To ensure trustworthiness, peer debriefing and member checking were employed. Participants were allowed to review preliminary findings and clarify or expand their viewpoints.

3. Discussion

This study explored how a brief, but structured Media and Information Literacy (MIL) intervention influenced Pakistani university students' awareness, critical thinking, and emotional engagement with misinformation. The results, drawn from three focus groups, align with and extend contemporary global literature on MIL pedagogy and digital resilience in higher education. One of the most notable outcomes was students' improvement in source evaluation and verification behavior. Participants mentioned using fact-checking platforms, verifying dates, and cross-referencing images, practices that reflect the "conceptual verification layer" proposed by Scheibenzuber et al. (Scheibenzuber et al., 2021), who emphasized the value of scaffolded problem-based MIL curricula for digital environments. Similarly, McGrew and Chinoy (McGrew, Chinoy, 2022) observed that undergraduate students benefited most from MIL courses when verification was combined with reflection on why misinformation spreads, not just how to detect it. These findings reinforce the importance of embedding practical verification exercises into university pedagogy, particularly in contexts like Pakistan, where misinformation often circulates through informal networks (like WhatsApp, TikTok), and institutional responses remain underdeveloped (Head et al., 2020).

Despite technical improvements, students frequently admitted emotional resistance to debunking content that resonated with their cultural, political, or religious beliefs. This mirrors what Boler et al. (Boler et al., 2025) term the "emotional override effect," where even high MIL awareness fails to translate into changed behaviors due to identity-affiliated content. Trixa and Kaspar (Trixa, Kaspar, 2024) similarly observed that emotions play a decisive role in how students in teacher education programs assess media truthfulness. This insight affirms earlier claims by Kiernan (Kiernan, 2017) and Balan (Balan, 2024) that MIL cannot be restricted to analytical tools; it must also foster emotional awareness, social empathy, and reflective bias training. This is particularly critical in societies like Pakistan, where misinformation often exploits religious sentiment or nationalist narratives, making objective analysis socially or emotionally costly.

A particularly powerful outcome of this study was the student-led demand for integrating MIL into core academic programs. Participants expressed that they were not only receptive to the training but felt it should be required. Similar findings are reported by Zarzosa and Ruvalcaba (Zarzosa, Ruvalcaba, 2025), who found that media literacy inoculation training had the highest impact when delivered as part of mandatory coursework. Maxmudova et al. (Maxmudova et al., 2024) highlighted the role of "vitagenic" content, truth-preserving MIL instruction rooted in local epistemologies, which aligns with the calls from Pakistani students in this study. Students articulated that misinformation related to local history, faith, and politics cannot be tackled with generic MIL resources. Instead, there is a strong case for developing context-aware, linguistically adaptable MIL curricula, a point echoed by Mrah (Mrah, 2022) in a Moroccan case study that addressed similar sociocultural challenges. The data from this study contribute to the evolving theory of "cognitive-emotional dual literacy" in MIL education. While earlier models of MIL emphasized factual accuracy and analytical reasoning, current literature points to a dual responsibility: building digital reasoning and emotional literacy (Aljalabneh, 2024; Orhan, 2023). From a pedagogical standpoint, this means institutions should not only teach students how to identify fake news but also how to regulate emotional responses, identify personal bias, and engage with dissenting information in constructive ways.

This study fills a vital gap in the underrepresented Global South context. While nations like Finland and Singapore have developed MIL-rich curricula, countries like Pakistan are still in the early conceptual phase, often relying on NGOs or ad-hoc workshops. This research contributes much-needed empirical evidence from Pakistan and supports Balan (Balan, 2024), who argues for regional MIL frameworks rooted in cultural literacy, linguistic fluency, and institutional policy change.

4. Results

This section presents the thematic findings of our qualitative case study examining how a short-term Media and Information Literacy (MIL) intervention influenced university students' engagement with misinformation. The analysis is based on three focus group discussions involving 30 undergraduate students from the Education, Mass Communication, and Islamic Studies departments at a public university in Punjab, Pakistan. Participants represented diverse academic years, gender identities, and media usage habits.

Among the participants, approximately 60 % identified as female, and the majority (around 70 %) were in their second or third year of undergraduate studies. Nearly all students reported daily use of social media platforms such as WhatsApp, TikTok, and YouTube, with over 80 % indicating they had previously shared unverified content at least once. Notably, none of the participants had received prior structured instruction in media or information literacy. These demographic insights provide context for the thematic findings that follow, which emerged from NVivo-assisted thematic analysis. The results are organized around four major themes that reflect changes in students' cognitive awareness, verification behavior, emotional responses, and pedagogical recommendations following the MIL intervention.

Theme 1: Increased Awareness of Misinformation Tactics. A prominent theme that emerged from all three focus groups was the increased cognitive awareness of misinformation strategies following the MIL intervention. Students described how the training changed their perception of seemingly trustworthy digital content and equipped them with basic evaluative strategies. Several participants specifically noted how common tactics, like altered headlines or recycled images, were previously unnoticed. As participants revealed,

"Before this, I thought if a news clip had a logo, it was genuine. Now I know they can just copy logos and make anything look real" (Participant 5, FGD 1).

"One post I saw was shared by ten of my friends. I just believed it. Now, I ask myself, 'Where's the source?" (Participant 3, FGD 2).

"I learned that even screenshots can be faked, not everything that looks official is official" (Participant 7, FGD 3).

This shift reflects what Tursunaliyevich (Tursunaliyevich, 2025) calls the cognitive awakening phase of MIL development. Students begin to view the media not as neutral but as constructed and potentially manipulative. The intervention thus fulfilled a key goal of MIL, raising critical consciousness, as shown in Figure 1 below.

Fig. 1. Word cloud of frequently mentioned terms in focus group discussions

Theme 2: Confidence in Source Evaluation and Verification. Another frequently recurring theme was a marked rise in students' confidence in their ability to cross-check and verify content. Participants demonstrated knowledge of specific tools and techniques introduced during the workshop, including reverse image searches, checking URLs, and using fact-checking platforms such as Snopes and AFP Pakistan.

"I used Google image search for a picture of a collapsed building, and it turned out to be from Syria, not Lahore" (Participant 2, FGD 1).

"Now, if someone sends me something, I don't just reply 'Wow.' I check if it was posted somewhere else" (Participant 4, FGD 2).

"I used to think if it's on a big page, it must be true. But now I learned to look at the author, not just the page name" (Participant 6, FGD 3).

These comments indicate early-stage behavioral shifts, moving from passive consumption to active interrogation of media. This finding resonates with Abuhasirah and Salameh's (Abuhasirah, Salameh, 2025) conclusion that even brief MIL training can instill verification habits in novice users, especially in low-resource academic contexts.

Theme 3: Persistent Trust Issues and Emotional Responses. Despite improvements in critical evaluation skills, students admitted they continued to struggle with emotional content and confirmation bias. Many revealed they were still inclined to believe or share information that aligned with their personal, religious, or political worldviews, even when they suspected it might be false.

"Some posts just make me angry or emotional. Even if I think it might not be real, I want to believe it because it supports what I feel" (Participant 6, FGD 2).

"My father sent a video on our family group about a protest. I knew it was old, but I didn't correct him. I didn't want to argue" (Participant 1, FGD 3).

"It's hard when the post is about religion. I feel bad checking or questioning it, even if something feels off" (Participant 5, FGD 1).

These responses highlight a crucial emotional dimension in misinformation engagement, where identity attachment often outweighs fact-checking. Similar patterns were observed by Serengga et al. (2025), who emphasized the role of affective reasoning in shaping student responses to misinformation. Even after acquiring verification skills, emotional content often bypasses students' critical filters. This underscores the need to embed emotional literacy and bias awareness into MIL pedagogy, not just technical skills.

Theme 4: Perceived Relevance and Demand for MIL in Curriculum. One of the strongest and most consistent themes was the students' belief that MIL should be part of the formal university curriculum. They viewed the one-time workshop as helpful but insufficient. Across all three focus groups, students expressed a desire for structured, semester-long instruction in digital verification and media ethics.

"This should not be optional. Every student needs to know how to deal with fake content before it affects their thinking" (Participant 8, FGD 2).

"I think it should be like a subject, not just a lecture. We should have assignments, practice, and grading" (Participant 3, FGD 1).

"I learned more in these two hours than in many of my regular classes. We need this kind of education in our syllabus." (Participant 2, FGD 3).
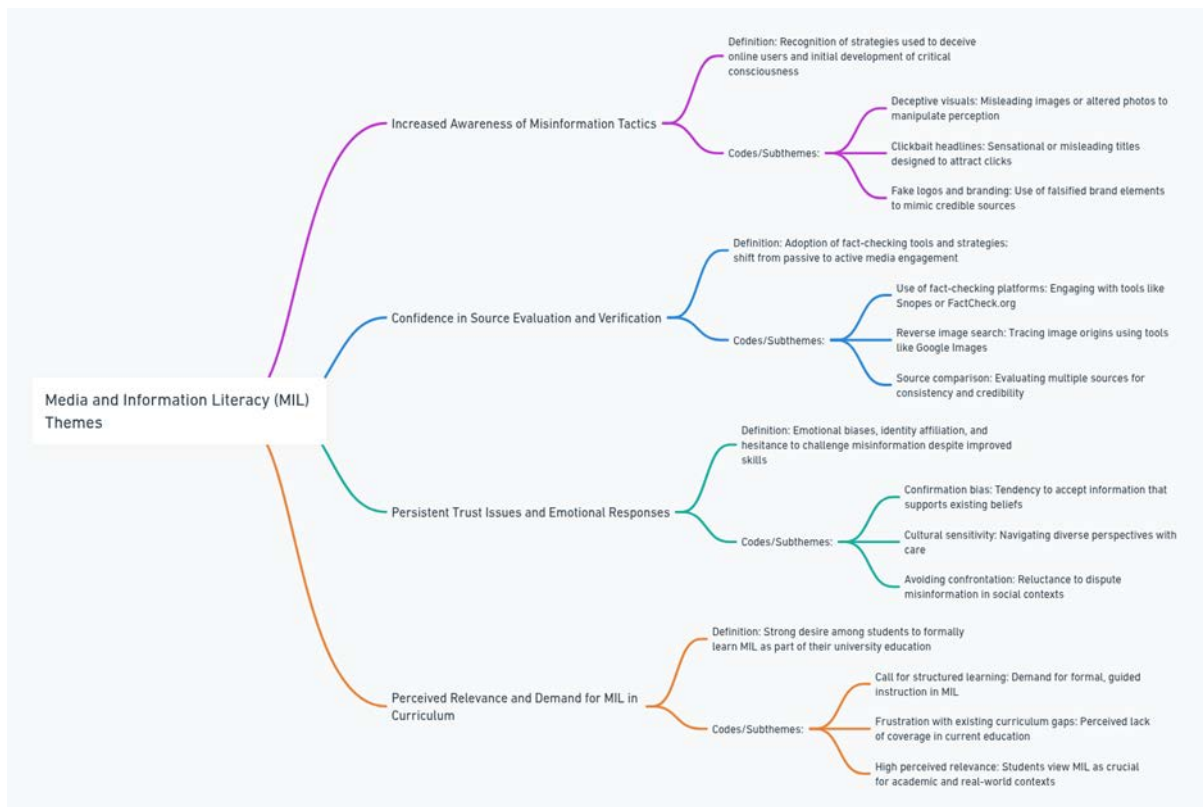
Fig. 2. Thematic node tree of emergent themes

This theme supports the argument by Madrid-Morales and Wasserman (Madrid-Morales, Wasserman, 2025), who advocate for the structural integration of MIL in higher education systems, especially in countries facing complex political and religious misinformation threats. Students' proactive calls for curricular inclusion suggest that MIL is not only useful but urgently needed and contextually demanded in Pakistan's academic environments.]

Table 1. Thematic Analysis

Theme	Definition	Codes/Subthemes
Increased Awareness of Misinformation Tactics	Recognition of strategies used to deceive online users and the initial development of critical consciousness.	Deceptive visuals- Clickbait headlines- Fake logos and branding
Confidence in Source Evaluation and Verification	Adoption of fact-checking tools and strategies; shift from passive to active media engagement.	Use of fact-checking platforms- Reverse image search- Source comparison
Persistent Trust Issues and Emotional Responses	Emotional biases, identity affiliation, and hesitance to challenge misinformation despite improved skills.	Confirmation bias- Cultural sensitivity- Avoiding confrontation
Perceived Relevance and Demand for MIL in the Curriculum	Strong desire among students to formally learn MIL as part of their university education.	Call for structured learning- Frustration with existing curriculum gaps- High perceived relevance

Table 1 highlights four key themes related to students' experiences with Media and Information Literacy (MIL) in the context of online misinformation. Students demonstrated an increased awareness of deceptive tactics such as fake visuals, clickbait headlines, and misleading branding. They also reported gaining confidence in evaluating sources by using fact-checking tools

and verification strategies like reverse image searches. However, emotional responses and biases, including confirmation bias and cultural sensitivities, continued to influence their willingness to confront misinformation. Finally, there was a strong perceived need for MIL to be included in the university curriculum, as students expressed frustration with current gaps and emphasized its relevance in today's digital world, as shown in Figure 2 above.

5. Conclusion

This study contributes important insights into how a structured, short-term Media and Information Literacy (MIL) intervention can shape students' critical engagement with misinformation in a university setting in Pakistan. Through qualitative inquiry, it was demonstrated that students not only became more aware of misinformation tactics but also began adopting concrete verification behaviors. These findings support a growing body of global evidence advocating for MIL's role in strengthening students' critical digital competencies (Tursunaliyevich, 2025). At the same time, the research highlights persistent challenges, particularly the emotional and cultural filters through which students process online content. Despite improved analytical awareness, many participants reported difficulty resisting emotionally charged or identity-aligned misinformation. This underlines the importance of integrating emotional reasoning and sociocultural reflection into MIL frameworks, a direction advocated by scholars like Bowhay (Bowhay, 2024), who argues that media literacy efforts must be contextually rooted and psychologically informed.

Moreover, the strong student-driven demand for formal MIL education suggests a significant opportunity for educational institutions in Pakistan to lead proactive reform. As Tursunaliyevich (Tursunaliyevich, 2025) recommends, curricular integration of MIL, beyond voluntary workshops, is essential to counter the systemic nature of digital disinformation. Embedding MIL across disciplines would help normalize critical thinking, media accountability, and ethical discourse as academic standards. This study also offers a methodological contribution: a case-based, context-aware model of MIL implementation that can be adapted across similar socio-educational environments in the Global South. By focusing on localized digital behavior, linguistic nuance, and emotional realism, the approach fosters deeper and more durable forms of media awareness.

Looking ahead, the expansion of MIL in Pakistan's higher education landscape requires multi-stakeholder collaboration. Universities, policymakers, and civil society must align to create inclusive, sustained, and critically grounded MIL programs. As disinformation becomes increasingly sophisticated, too, the pedagogical responses aimed at empowering young digital citizens to think clearly, verify responsibly, and engage ethically in the digital public sphere.

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Participatory Culture and New Media Literacies in Indonesia's Traditional Arts Communities

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Abstract

This study explores how traditional arts communities navigate digital transformation while preserving cultural authenticity, focusing on Larasati Art Studio in Purbalingga, Indonesia. Using a qualitative case study approach, we examined 50 participants across three age-based class levels through interviews, Focus Group Discussions, and participant observation to understand digital literacy integration within traditional arts contexts. Key findings reveal critical dimensions of digital cultural adaptation. Traditional hierarchical learning structures successfully integrated with digital communication methods, maintaining cultural values while embracing technological opportunities. Furthermore, strategic digital integration enabled sustainable cultural preservation, evidenced by membership growth from 50 to 80 participants and enhanced global visibility. The research demonstrates that thoughtful digital adoption can strengthen community bonds and cultural transmission without compromising authenticity. Participants successfully negotiated tensions between global digital reach and local cultural meaning through community-controlled curatorial strategies. However, significant challenges persist, including generational digital divides and risks of cultural decontextualization. This study offers valuable practical insights for traditional arts communities worldwide seeking to adapt to digital environments while preserving their cultural heritage and addressing contemporary participation challenges.

Keywords: cultural preservation, digital literacy, digital transformation, participatory culture, traditional arts communities.

1. Introduction

Globalization and technological development present challenges to the preservation of traditional culture. Research indicates that in the contemporary era, cultural literacy cannot be separated from digital literacy. The ability to understand, appreciate, and transmit cultural heritage now requires mastery of information and communication technology (Borowiecki, Navarrete, 2017; Gálik et al., 2024). The concept of cultural literacy has evolved significantly in the last decade. Initially defined by Hirsch (Hirsch, 1987) as the knowledge a person must possess to participate effectively in a culture, cultural literacy has expanded to include the ability to interpret, negotiate, and create cultural meaning through various digital media and platforms. In the contemporary digital context, however, this definition has expanded to include the ability to interpret, negotiate, and create cultural meaning through various digital media and platforms (Pangrazio, 2016). Digital cultural literacy requires an understanding of cultural content and the ability to critically evaluate cultural representations in digital media. It also requires the ability to actively participate in the production and distribution of cultural content.

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The Larasati Art Studio in Purbalingga exemplifies the challenges that many traditional art communities in Indonesia face. With a membership dominated by young people, the studio strives to preserve traditional art practices while adapting to changing times. Studies of art communities in Southeast Asia indicate that integrating digital technology into traditional art practices can boost youth engagement and broaden audience reach (Bakar, Bidin, 2014). However, this integration process requires a careful approach to ensure that the authentic values of traditional art are not eroded during digitization.

Group dynamics within art communities have unique characteristics that distinguish them from other social groups. Tuckman's classic theory (Tuckman, 1965) on the stages of group formation – forming, storming, norming, performing, and adjourning – remains relevant, yet it requires reinterpretation in a digital context (Bonebright, 2010). Gockel and Werth's (Gockel, Werth, 2010) research shows that groups interacting through digital media undergo a different formation process. In this process, the storming stage can be minimized through more structured and documented communication. Understanding digital group dynamics is crucial for designing effective communication strategies in the context of traditional art communities (Gockel, Werth, 2010).

Social media has become an important space for art communities to develop and maintain their collective identity. Platforms such as Facebook, Instagram, and YouTube serve as tools for documentation and as creative spaces where traditional art can be reinterpreted and presented to a global audience (Vicente et al., 2012). Studies show that art communities' use of social media can increase visibility, expand networks, and create new opportunities for collaboration. However, challenges remain in maintaining cultural authenticity while adapting to the logic and aesthetics of social media.

Traditional arts communities contribute to creating inclusive, safe, resilient, and sustainable cities and settlements by preserving cultural heritage and strengthening local identity (Duxbury, Jeannotte, 2011). Studies indicate that communities engaged in robust artistic activities exhibit higher social capital and demonstrate greater adaptability to socioeconomic changes. Cultural literacy in the digital age requires a multifaceted approach that integrates various competencies. Jenkins et al. (Jenkins et al., 2016) identified several key new media literacy skills relevant to digital cultural literacy. These include the ability to participate in online communities, create and share content, and engage in creative remixing while respecting copyright and cultural values (Jenkins et al., 2016).

In the context of traditional arts, however, these skills must be balanced with a deep understanding of traditional cultural values and practices to avoid cultural appropriation or trivialization. Research on the use of social media by arts communities shows mixed results. On the one hand, social media opens up opportunities to democratize access to the arts and culture by enabling small communities to reach global audiences (Kidd, 2016).

However, the logic of social media algorithms can encourage the homogenization of content, emphasizing visually appealing aspects over cultural depth. Traditional arts communities must navigate this tension by developing strategies that leverage the power of social media while maintaining their artistic and cultural integrity. An important aspect of developing cultural literacy through digital technology is the concept of participatory culture. Jenkins (Jenkins, 2006) defines it as a culture with low barriers to artistic expression and civic engagement, strong support for creation and sharing, and informal mentoring where experienced individuals pass on knowledge to beginners. In the context of traditional art communities, participatory culture can facilitate intergenerational knowledge transfer and encourage innovation in traditional art practices (Jenkins, 2006).

Group dynamics in the digital age are also influenced by the concept of networked individualism. This concept describes how, in networked societies, individuals have greater autonomy in choosing their group affiliations but must also manage multiple belonging or dual memberships (Wellman et al., 2006). In traditional art communities, this means members may have divided loyalties between traditional and online communities, creating challenges in maintaining group cohesion. Research on the digital divide shows that access to technology alone is insufficient for meaningful participation in digital culture. Van Dijk (Van Dijk, 2020) identifies three levels of the digital divide: physical access, digital skills, and meaningful use. In traditional art communities, these divides are further complicated by generational gaps and differing attitudes toward technology between older tradition keepers and younger members (Van Dijk, 2020). Studies on using social media for cultural preservation show that success depends greatly on the

community's ability to develop authentic, engaging content. In his study on YouTube and intangible cultural heritage, shows how video platforms can serve as living archives for traditional cultural practices yet also face risks of decontextualization and commodification (Pietrobruno, 2013).

Traditional arts communities must develop strategies that address both aspects to leverage social media effectively. In the Indonesian context, research on digital media and cultural identity shows how local communities use digital technologies to negotiate their identities in national and global contexts (Jurriëns, Tapsell's, 2017). Their findings are relevant to understanding how Larasati art studio and similar communities can use digital media to strengthen local identity and connect with broader networks. An approach integrating an understanding of group dynamics, cultural literacy, and social media strategies is crucial for developing sustainable models.

This research aims to fill a gap in the literature by exploring how group dynamics in traditional art communities, particularly Larasati art studio, can be optimized through the strategic use of social media to improve cultural literacy. Using a case study approach and qualitative methods, the study aims to produce a nuanced understanding of the social and cultural processes involved in integrating digital technology into traditional art practices. The study also aims to develop practical recommendations that other traditional art communities can implement to maintain relevance in the digital age.

2. Materials and methods

This study adopted a qualitative case study approach to explore the integration of digital literacy within the traditional arts community at Larasati Art Studio in Purbalingga, Indonesia. The focus was on understanding how digital media and social media platforms contribute to cultural literacy and group cohesion in a traditional arts setting. The research was guided by qualitative methodologies (Creswell, Poth, 2018) and applied specifically to the context of community arts and digital technologies (Flick, 2018).

Data was collected through a combination of in-depth interviews, Focus Group Discussions (FGDs), and participant observation. The FGDs were conducted with 50 participants, divided into three groups: Class A, consisting of children from kindergarten and elementary school; Class B, consisting of middle school students; and Class C, composed of high school students, university students, and even working adults. This classification was based on both age and skill levels, and members can advance through the classes based on their performance in evaluation shows. FGDs are effective for eliciting group dynamics and understanding collective experiences, and they provided insight into how participants use and adapt digital tools for cultural preservation. In addition, key informant interviews with the founders of the art studio and other key figures helped deepen the understanding of the organizational dynamics and challenges in implementing digital tools for art education (Krueger, Casey, 2015).

This method helped in assessing the practical use of digital literacy in art practice and its role in community engagement. Thematic analysis, was applied to analyze the data collected from the interviews, FGDs, and observations (Braun, Clarke, 2022). This process involved coding and identifying recurring themes, particularly focusing on how the integration of digital technology has influenced group interactions and the formation of community identity in the context of traditional arts. The study found that the use of social media platforms, such as Instagram and YouTube, has facilitated group cohesion by enabling members of Larasati art studio to interact across physical and digital spaces.

Additionally, the analysis emphasized the role of digital literacy in fostering cultural literacy, as members demonstrated the ability to produce and share content, thus contributing to the preservation and promotion of traditional arts (Borowiecki, Navarrete, 2017; Vicente et al., 2012). The study further explored how the digital divide and generational gaps affected the ability of community members to fully engage with technology and cultural content, highlighting the importance of digital skills in fostering effective participation and engagement in cultural practices (Van Dijk, 2020). Triangulation was used to ensure the validity and reliability of the study's findings by comparing data from multiple sources, including different groups within the community, various types of data collection, and key informants (Flick, 2018). This approach provided a holistic view of how digital media is transforming traditional art practices in the community and contributed to the preservation of cultural heritage.

3. Discussion

The findings from the Larasati Art Studio case reveal significant implications for understanding how traditional art communities navigate digital transformation while preserving cultural authenticity. The observed transition from hierarchical to participatory models aligns with contemporary research on digital media's role in reshaping cultural participation, demonstrating that participatory culture can coexist with traditional cultural preservation while addressing digital inequalities that may emerge in these communities (Cvetičanin et al., 2024). Recent scholarship emphasizes that successful digital cultural participation requires understanding the complex interplay between social inequalities and digital access patterns within community contexts (Suwana, 2021).

The application of communities of practice theory to this context provides crucial insights into how traditional learning environments adapt to digital integration. Digital media literacy has become fundamental to cultural participation in the 21st century, requiring individuals to develop sophisticated skills for navigating and creating content across multiple platforms while maintaining cultural authenticity (Austin, Domgaard, 2024). Contemporary research on digital cultural participation emphasizes that access to digital platforms does not automatically democratize cultural engagement, but rather requires strategic interventions that address existing social stratifications (Mihelj et al., 2019). The emergence of multi-membership patterns, where participants engage simultaneously in physical and digital spaces, suggests a hybrid model that extends rather than replaces traditional community structures, challenging assumptions that digitization necessarily leads to the erosion of traditional practices (de Souza e Silva et al., 2025).

The observed changes in group dynamics and leadership structures reflect broader patterns in digital communication theory, particularly regarding how individuals construct their perceptions of media use within community contexts. Recent theoretical frameworks in communication studies emphasize that media effects are socially constructed through community interactions and shared cultural understandings, rather than being direct technological determinants (Vanden Abeele et al., 2024). Research on digital disconnection patterns reveals that successful community integration requires strategic approaches that balance technological engagement with cultural values and authentic relationship building (Wolfers, 2024). This finding has particular relevance for traditional arts communities, where social definitions of appropriate technology use are negotiated through collective participation and cultural transmission.

The concept of media multiplexity proves particularly relevant in explaining how traditional communities maintain cohesion across diverse digital platforms (Hutchinson, 2023). Recent studies on social media engagement patterns reveal that traditional communities can leverage platform diversity to create multifaceted digital identities while preserving core cultural values (Bruns, 2023). The studio's strategic use of WhatsApp, Instagram, and YouTube for different community functions demonstrates sophisticated understanding of how various media serve distinct relationship-building purposes, supporting theories of mediated cultural transmission in digitally connected societies.

However, the identification of significant challenges, particularly the digital divide between generational cohorts, highlights critical considerations for traditional art communities (Setiansah et al., 2024). The tension between technological accessibility and inclusive participation represents a fundamental challenge that requires careful navigation to avoid inadvertently excluding valuable community members who possess traditional knowledge but limited digital literacy. The risk of cultural decontextualization emerges as a particularly complex challenge in the digital presentation of traditional art forms. Contemporary media studies research emphasizes the importance of developing critical frameworks for evaluating how digital platforms can both preserve and potentially distort cultural meanings in global circulation (Brady, Crockett, 2024). While digital platforms offer unprecedented opportunities for global cultural exchange and community resource access, they simultaneously create potential for cultural meanings to be lost or distorted in translation to digital formats, particularly when algorithmic systems prioritize engagement metrics over cultural authenticity.

Contemporary communication theory emphasises that successful digital integration within cultural communities requires an understanding of both the technological capabilities of platforms and the social dynamics that govern their use in specific cultural contexts (Poell et al., 2025). Furthermore, the long-term sustainability of hybrid physical–digital community models remains an open question requiring longitudinal investigation. Recent research on digital transformation in

cultural institutions indicates that successful adaptation necessitates an ongoing negotiation between technological possibilities and cultural values, rather than the one-time implementation of digital tools (Ateca-Amestoy, Prieto-Rodriguez, 2024). While the immediate benefits of increased participation and expanded reach are evident, the long-term effects on cultural transmission, community identity and the preservation of traditional knowledge require sustained empirical investigation in order to understand the full implications of these transformations for Indonesian traditional arts and similar cultural communities around the world.

4. Results

This study focuses on understanding how digitization influences group dynamics and the preservation of traditional arts at Larasati Art Studio, Purbalingga. A key finding is Larasati Art Studio's development of digital cultural literacy and integration of technology into traditional art practices. The research findings are: a. digital cultural literacy development through participatory culture, b. dynamic changes in the digital space, c. sustainable cultural preservation through strategic digital integration. Each point discusses how these aspects contribute to the sustainability of traditional art communities and cultural preservation in the digital age.

a. Digital Cultural Literacy Development Through Participatory Culture

The evolution of cultural literacy at Larasati Art Studio exemplifies a sophisticated shift from conventional knowledge dissemination to participatory digital engagement. In this paradigm, participatory culture pivots from individual expression to community involvement through collaboration and networking (Jenkins, 2009). Focus group discussions across three class levels revealed systematic progression in digital capacity building. Class A (kindergarten-elementary) demonstrated intuitive social media engagement, Class B (middle school) exhibited platform experimentation, and Class C (high school-adult) displayed sophisticated content creation and curation capabilities. An analysis of platform utilization over seven years reveals a progression from basic informational Instagram posts in 2017 (858 followers, 357 posts) to a comprehensive, multi-platform presence, including a Google Business (4.8/5 rating), YouTube (223,865 total views), and TikTok adoption (8,217 likes) by 2024 (Ayu et al., 2025).

The participatory culture skills development at Larasati Art Studio encompasses competencies where new literacies involve social skills developed through collaboration and networking, building on traditional literacy foundations (Jenkins et al., 2006). Play capabilities emerged through younger members experimenting with traditional dance adaptations for digital platforms, particularly evident in TikTok content creation where members remix traditional movements with contemporary trends. Appropriation skills developed through creative sampling and remixing of traditional movements for social media formats, enabling cultural transmission through contemporary communication channels without compromising traditional values (Saud et al., 2025).

Collective intelligence flourished through the peer mentoring systems identified in focus group discussions (FGDs), where senior Class C members guided the creation of digital content and the utilisation of the platform across all class levels, thereby creating legitimate peripheral participation pathways (Lave, Wenger, 1991). Key informant interviews with the founders of the Larasati art studio revealed that this mentoring system extends beyond the sharing of technical skills to encompass the transmission of cultural knowledge, thereby ensuring that digital content maintains cultural authenticity and educational value. This dimension of collective intelligence is particularly significant for preserving traditional arts, as FGD participants demonstrated knowledge pooling across generations while leveraging the community's diverse technological competencies.

The transmedia navigation competency manifested through members' sophisticated use of multiple platforms for storytelling and cultural documentation, uploading complete performances on YouTube while sharing promotional clips on Instagram and TikTok. This multi-platform strategy demonstrates how communities working to preserve cultural heritage prioritize community-centered preservation ensuring authenticity, inclusivity, and continued relevance of traditions (Google Arts & Culture, 2024). Digital platforms facilitate what Jenkins characterizes as participatory culture environments where online communities share artistic and creative content while engaging in collaborative participation (Jenkins et al., 2016).

However, FGD analysis across all three classes revealed developmental gaps in critical evaluation and judgment competencies, with participants predominantly creating documentation content rather than analytical or interpretive materials. Key informant interviews confirmed this limitation, suggesting need for enhanced critical digital literacy training that enables community

members to evaluate information credibility and cultural appropriateness in digital contexts. Class C participants showed strongest development in critical competencies, while Class A and B participants required additional guidance in maintaining cultural integrity while engaging with global digital audiences who may lack contextual understanding of traditional art forms.

Table 1. Participatory Culture Skills Manifestation (Jenkins, 2009; Jenkins et al., 2013)

Jenkins (2009) Skills	Community Manifestation	Cultural Impact
Play	Experimentation with dance adaptations for TikTok	Maintains cultural relevance for younger generations
Appropriation	Remixing traditional movements for social media	Enables cultural transmission through contemporary formats
Collective Intelligence	Peer mentoring systems across generations	Preserves traditional knowledge while building digital skills
Transmedia Navigation	Multi-platform storytelling (YouTube, Instagram, TikTok)	Maximizes cultural reach and audience engagement
Networking	Cross-community interaction through social media	Expands cultural exchange and learning opportunities

Source: authors' data analysis

b. Dynamic Changes in the Digital Space

The evolution of community dynamics within Larasati Art Studio reveals complex negotiations between traditional organizational structures and digital communication patterns, as evidenced through participant observation and structured FGD sessions across the three class levels (Krueger, Casey, 2015). Communities of practice are composed of individuals sharing identity based on specific domains, requiring regular interaction to develop competence (Lave, Wenger, 1991).

FGD participants demonstrated three distinct digital engagement patterns: Class A members showing intuitive technology use, Class B members successfully adapting to technological requirements, and Class C members serving as digital mentors while maintaining traditional knowledge authority. The emergence of digital-physical hybrid community structure addresses fundamental challenges in traditional art preservation, particularly intergenerational knowledge transmission and contemporary relevance maintenance.

FGD sessions revealed sophisticated communication adaptation strategies that preserve traditional respect protocols while accommodating digital informality expectations. Participants across all classes maintained formal greeting patterns and hierarchical acknowledgment systems in WhatsApp group communications, while adopting contemporary social media conventions on Instagram interactions. Key informant interviews with organizational leaders confirmed this dual communication standard demonstrates community agency in defining digital engagement terms rather than passively accepting platform-imposed interaction norms. The blended communication approach enables inclusivity across class levels and age preferences while maintaining cultural values embedded in traditional interaction patterns.

Participant observation revealed learning methodology evolution reflecting integration of traditional demonstration-based instruction with digital tutorial systems, creating multimodal learning environments that enhance rather than replace traditional pedagogical approaches. FGD participants across all classes reported that video tutorials enable asynchronous learning and repeated practice opportunities supporting traditional face-to-face instruction. This addresses scheduling limitation challenges identified in interviews regarding communication barriers between different class levels, where "different schedules for each class make inter-class communication limited." The hybrid learning model accommodates diverse learning preferences while maintaining essential elements of traditional knowledge transmission including embodied learning and cultural context provision.

Communities of practice involve three fundamental dimensions: mutual engagement (regular interaction developing norms and relationships), joint enterprise (shared understanding of community purpose), and shared repertoire (common resources including routines and vocabularies) (Wenger, 1998). The community successfully navigates tensions between traditional hierarchical respect systems and digital participation patterns that often flatten traditional

authority structures, demonstrating sophisticated adaptation strategies preserving cultural values while embracing technological opportunities.

Table 2. Digital-Traditional Integration Synthesis (Wenger, 1998; Lave, Wenger,1991)

Community Aspect	Traditional Approach	Digital Integration	Hybrid Synthesis
Knowledge Transmission	Direct demonstration	Video tutorials	Multimodal learning combining physical and digital instruction
Community Building	Weekly physical gatherings	Social media interaction	Continuous engagement across platforms
Cultural Documentation	Oral tradition	Digital archives	Comprehensive preservation combining methods
Audience Engagement	Local performances	Global social media reach	Multi-level cultural sharing

Source: authors' data analysis

Participant observation and key informant interviews revealed that boundary-spanning activities including outing classes and outbound programs serve crucial functions in maintaining community cohesion across class divisions and digital engagement variations. FGD participants emphasized these activities function as "boundary objects" facilitating cross-class interaction and shared understanding development, proving essential for hybrid community sustainability (Krueger, Casey, 2015). The physical gathering importance persists despite digital connectivity, with participants across all classes confirming that successful digital integration supplements rather than replaces traditional community building practices.

c. Sustainable Cultural Preservation Through Strategic Digital Integration

The sustainable preservation model emerging from Larasati Art Studio represents a sophisticated integration of traditional cultural practices with digital innovation, as revealed through comprehensive FGD analysis and key informant interviews with the studio's founders (Creswell, Poth, 2018). This model underscores the significance of blending cultural heritage with modern technology, ensuring that traditional practices remain relevant and accessible while also adapting to contemporary digital landscapes.

Historically, Larasati Art Studio had not been monetized, but with the emergence of social media platforms, the studio has gained significant recognition. This increased visibility has opened up opportunities for collaboration with other local art communities in Banyumas and Purbalingga. By featuring their activities and performances on social media, Larasati Art Studio has not only attracted global attention but also generated viewer engagement. As a result, the number of members has seen a remarkable increase, with the studio initially recording 50 students in 2024, and this number growing to 80 students in 2025. This growth highlights how the digital presence of the studio can contribute to both cultural engagement and community expansion, while also maintaining the authenticity of traditional art forms.

The community's three-tier class system demonstrates how traditional cultural practices can leverage digital platforms for global reach and economic sustainability without compromising essential cultural values or traditional knowledge systems. Digital technologies have profound impacts on cultural sectors, enabling cultural institutions to maintain relevance while preserving cultural diversity (UNESCO, 2023). This shift to digital platforms allows Larasati Art Studio to maintain the integrity of its cultural expressions, while expanding its global audience reach.

The Integrated Cultural Preservation Model developed in this research is based on findings and various relevant sources. This conceptual model is a synthesis of the digital cultural preservation framework developed by UNESCO (2023), the concept of authenticity in heritage conservation proposed by Gao, Jones (2021), and empirical findings obtained through a case study of Larasati Art Studio (Gao, Jones, 2021; UNESCO, 2023). This model illustrates how the integration of digital technology can strengthen the preservation of traditional culture without sacrificing the authentic values it contains. The following is an illustration of the model shown in

Figure 1, which depicts the two-way relationship between the preservation of traditional knowledge and the adoption of digital innovation, as well as its impact on cultural sustainability.

The model addresses fundamental challenges in cultural heritage preservation, including economic viability, global visibility, and intergenerational transmission while mitigating risks of cultural decontextualization and commodification. Digital cultural heritage encompasses procedures of internal storage, network sharing, and interaction regarding content (IFLA, 2024). Key informant interviews with organizational leaders revealed economic sustainability achievement through digital platform monetization, providing crucial support for traditional art form continuation and community development. The community's success metrics, including 116,000 YouTube views, 858 Instagram followers, and a 4.8 Google Business rating, demonstrate market validation of digital cultural content while maintaining authentic traditional art representation. This validation is an indicator that digital platforms can be used as tools to enhance the economic viability of traditional cultural practices while still preserving their authenticity.
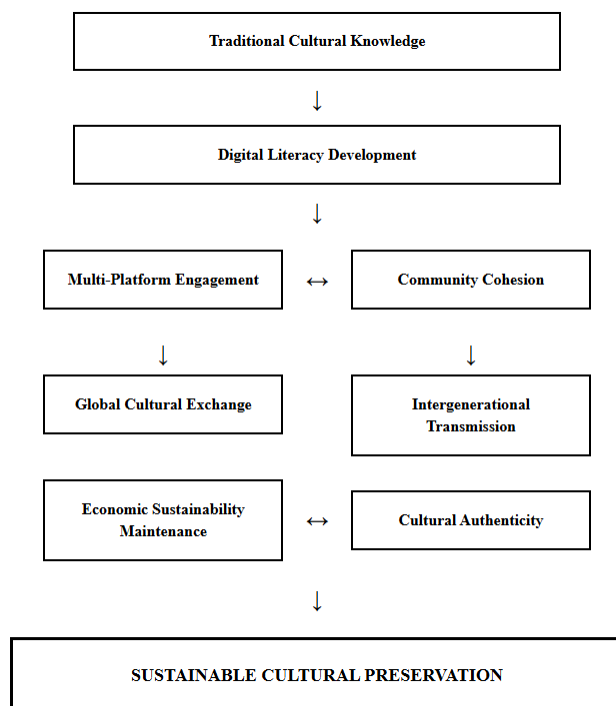
Fig.1. Integrated Cultural Preservation Model

Virtual heritage propagated through new media has strong potential to increase cultural awareness about disappearing cultural heritage and bring traditional arts into public knowledge domains (Ahmad et al., 2024). The community's curatorial approach ensures digital content provides adequate cultural context while engaging contemporary audiences through accessible formats. The integration of traditional knowledge systems into digital platforms ensures that cultural meanings remain accessible and authentic, ensuring the continuity of traditions despite the rapid pace of globalization and technological advancements (Zhang et al., 2024).

In alignment with the Sustainable Development Goals (SDGs), Larasati Art Studio makes significant contributions to Quality Education (SDG 4) through the implementation of Target 4.7. This target ensures that learners acquire knowledge for sustainable development, including an appreciation for cultural diversity. The studio's educational approach integrates traditional Indonesian cultural values with 21st-century skills development, creating pedagogical models that are essential for comprehensive education. Digital documentation and tutorial creation have provided accessible learning resources, extending the educational impact beyond immediate community boundaries while preserving authentic cultural transmission methods. The contribution to Sustainable Cities and Communities (SDG 11) through the achievement of Target 11.4 further strengthens efforts to protect and safeguard cultural heritage through digital documentation and dissemination strategies. The community demonstrates how local cultural

practices contribute to urban sustainability through cultural tourism potential, community pride development, and intergenerational engagement, which strengthens social cohesion and cultural identity maintenance. Cultural institutions and individual cultural professionals worldwide are increasingly enlisting digital technologies to compensate for lost time, enabling culture fans to access theatrical productions, concerts, or explore cultural riches virtually (UNESCO, 2023).

FGD analysis across all three classes revealed sophisticated approaches to addressing identified challenges, including digital literacy gaps, cultural decontextualization risks, and platform commodification concerns through comprehensive community-controlled strategies (Flick, 2018). Participant observation confirmed that digital literacy training programs accommodate different class-level learning preferences and technological comfort levels, ensuring inclusive participation across community demographics. Key informant interviews emphasized that cultural context preservation requires curatorial approaches embedding traditional knowledge systems within digital presentations, maintaining cultural meaning accessibility and authenticity for global audiences while serving local community development needs. Cultural heritage authenticity in digital contexts demands balancing technological innovation with the preservation of fundamental cultural values and meanings that define community identity.

5. Conclusion

This study demonstrates that the integration of digital technology in traditional art communities represents a significant shift, not merely a technological adoption. The case of Larasati Art Studio highlights how traditional arts communities can embrace digital transformation while maintaining cultural authenticity through thoughtful digital strategies. Three key conclusions emerge from the study. First, the development of digital cultural literacy through participatory culture has created meaningful pathways for cultural preservation and intergenerational knowledge transfer. As students advanced from basic digital engagement to more complex content creation, it became clear that digital platforms can complement traditional learning methods, fostering both digital and cultural literacy. Second, the evolution of group dynamics in digital spaces shows that traditional hierarchical structures and digital participatory culture can coexist. By integrating physical and digital engagement, the studio preserves cultural values while embracing opportunities for enhanced communication, learning, and community building. This balance allows for the preservation of traditional practices while adapting to digital communication methods. Third, sustainable cultural preservation through strategic digital integration offers viable solutions for economic sustainability, global visibility, and community growth.

However, challenges remain, such as the digital divide, cultural decontextualization, and commodification risks. Addressing these requires careful curatorial strategies, digital literacy training, and community-driven approaches focused on cultural integrity. In conclusion, this study emphasizes the need for traditional arts communities to strategically integrate digital tools, ensuring sustainability while preserving core cultural values. The Larasati Art Studio model offers valuable insights for other cultural communities, and future research should explore the long-term sustainability of hybrid physical-digital models, as well as the mechanisms that facilitate the successful integration of traditional knowledge with digital innovation.

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Assessing and Addressing Gaps in Media Education: Faculty Perspectives on Integrating Media Literacy into University Curricula

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Abstract

This study explores faculty perspectives on integrating media literacy into the curricula of media education in the underrepresented regions of India – Odisha and Jharkhand. In an era of escalating mis/disinformation, the research underscores the critical role of media literacy in higher education for fostering critical thinking, ethical media engagement, and informed citizenship among Mass Communication students. The study involved conducting semi-structured interviews with media educators from six universities representing central, state and private institutions. A thematic analytical approach was used to examine faculty members' conceptual understanding of media literacy, their pedagogical practices, perceived institutional challenges and their recommendations for strengthening media literacy education. The study reveals that the educators unanimously recognise the growing importance of media literacy in this age of information disorder. However, its incorporation into Mass Communication programmes remains limited and uneven. Public universities struggle with outdated curricula, bureaucratic delays, and shortages of resources and trained manpower, which hinder meaningful integration. Although private universities enjoy greater flexibility and comparatively better infrastructure, their focus tends to lean towards technical and industry-oriented training, often at the cost of fostering critical media literacy competencies. The study calls for systematic reforms, including enhanced faculty training, interdisciplinary collaboration, participatory pedagogies, and policy-level interventions aligned with global media literacy frameworks. Incorporating faculty voices into the broader discourse on higher education reform, the research advocates for a structured approach to embedding media literacy across curricula to cultivate critically informed and engaged citizenship.

Keywords: media literacy, media education, faculty perspectives, curriculum development, Odisha, Jharkhand.

1. Introduction

The conventional notion of literacy has evolved significantly with the rapid expansion of digital technologies over the past two decades. This advancement has transformed everyday practices, particularly in the ways information is constructed, shared, disseminated, and consumed (Currie, Kelly, 2022; Gálik, 2020). Given the immense power of digital media to shape people's values, beliefs, behaviours, and decisions (Baran, 2011), basic reading, writing, and arithmetic skills are no longer sufficient in an era of information overload. Alongside these challenges are issues related to privacy, security, cyberbullying, addiction, and phishing (Burnett, Merchant, 2011). In this context, students of Mass Communication – who will become the journalists, content creators, and opinion leaders of tomorrow – play a critical role. Strong media literacy skills among these students are essential for fostering a healthy information ecosystem. Consequently, media

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education must focus on equipping learners with the competencies required to become both critical consumers and responsible producers of media content.

The National Association for Media Literacy Education (NAMLE) defines media literacy as "the ability to access, analyze, evaluate, create, and act using all forms of communication" (Potter, 2022). Media literacy has been widely acknowledged as a lifelong learning competency essential for empowerment, creativity, and informed citizenship (Hobbs, 2010). Empirical research further establishes that students exposed to media literacy education (MLE) are better able to detect misinformation and disinformation, resist stereotypes, and develop civic sensibilities. Educational institutions are thus the most appropriate sites for cultivating media literacy competencies. For this ecosystem to thrive, not only media educators but also teachers from other disciplines must themselves be media literate (Domine, 2011).

Many developed countries have integrated media literacy skills into their pedagogy, often embedding them within teacher training programmes. In contrast, in developing countries such as India, this dimension remains underemphasised. Scholars have argued that the absence of media literacy education in teacher training constitutes one of the key barriers to its effective implementation (Alvermann, Moon, Hagood, 2018). Despite policy interventions such as the National Education Policy (NEP) 2020, India's education system continues to rely heavily on rote learning and has failed to nurture a culture of critical thinking and reflective analysis (Singh, Rai, 2025). This deficiency is shaped by multiple, interrelated factors. While government policy is a major determinant, teachers, students, and the broader functioning of educational institutions at the ground level also play significant roles in sustaining these shortcomings.

When considering states such as Odisha and Jharkhand in India, which remain among the underdeveloped regions of the country, the situation appears even more critical. A significant proportion of the population in these states continues to struggle for basic necessities. In this context, it becomes imperative to critically examine and assess the education system, with particular attention to media education. Despite the pressing need, limited research has been conducted on the educational landscape of these underrepresented states. This study makes a modest attempt to address this gap by examining the state of media literacy, specifically through the perspectives of experienced faculty members engaged in media education. Their insights are expected to provide a deeper understanding of the challenges and constraints faced by media educators in these regions, as well as their views on integrating media literacy into Mass Communication curricula. Furthermore, the study explores the barriers to effective implementation and presents suggestions for strengthening media literacy education within these contexts.

Accordingly, this study aims to explore how faculty members in Odisha and Jharkhand perceive and integrate media literacy education into their teaching practices and curricula. Specifically, it examines educators' understanding of media literacy concepts, evaluates the extent to which media literacy components are included in Mass Communication curricula, and analyses the pedagogical and institutional barriers that influence its effective adoption. In doing so, the research captures faculty recommendations for strengthening media-literacy competencies among communication students. Insights from faculty perspectives in Odisha and Jharkhand can offer a roadmap for advancing media education in India and other developing countries with similar contexts, particularly in integrating media literacy as a core component.

2. Materials and methods

The researchers employed a qualitative exploratory design to examine how media educators perceive and integrate media literacy within Mass Communication curricula in the eastern Indian states of Odisha and Jharkhand. A qualitative approach was adopted to get in-depth understanding of institutional practices, pedagogical approaches, and barriers in contexts of media literacy's integrations in Mass Communication curricula.

Sampling and Participants

A purposive sampling strategy was used in the study to ensure representation across central, state, and private universities in Odisha and Jharkhand to get the teachers' perspectives. Faculties from the Mass Communication departments from six institutions were selected: Central University of Odisha, Berhampur University, Birla Global University, Central University of Jharkhand, Ranchi University, and Amity University Ranchi.

The researchers initially had planned for 12 faculty interviews (two per university), but due to institutional constraints, one interview at Amity University Ranchi could not be conducted. Thus,

the thematic analysis is based on the inputs from 11 faculty members, still maintaining balance across the institutions. Respondents were faculty engaged in teaching and curriculum-related responsibilities in the mass communication departments of the respective universities. The participating media educators were selected either on the basis of their seniority within the Mass Communication departments or due to their expertise in media literacy. This selection ensured that they possessed the requisite authority and professional experience to offer meaningful insights into media literacy education and its integration within their respective departmental curricula.

Data Collection

The researcher visited the respective departments in person to conduct semi-structured interviews with faculty members between June and August 2024. Each interview lasted 30–40 minutes and followed a fixed set of guiding questions with scope for flexibility in interactions. The focus was on recording insights of faculty on:

1. Integration of media literacy components.
2. Pedagogical practices.
3. Institutional and policy barriers.
4. Suggestions for improvement.

With participants' consent, interviews were audio-recorded, later transcribed using TurboScribe software. Ethical clearance was obtained from the researcher's home institution as well as the participating faculty members. All participants were informed about the study's purpose, provided informed consent, and assured of confidentiality and anonymity.

Data Analysis

The data analysis process in this study was guided by the Reflexive Thematic Analysis (RTA) framework proposed by Braun and Clarke (Braun, Clarke, 2006). This approach emphasises researcher reflexivity and interpretive engagement in identifying, shaping, and refining themes. RTA is widely recognised and applied in exploratory qualitative research, making it suitable for the purposes of this study. Analysis followed Braun and Clarke's six-step process:

1. Familiarization with transcripts.
2. Generating initial codes.
3. Searching for themes.
4. Reviewing themes.
5. Defining and naming themes.
6. Producing the report.

Coding was conducted manually using Microsoft Word and Excel to strengthen reflexive engagement. Both shared codes (common across Odisha and Jharkhand) and unique codes (state-specific) were identified.

Visual Presentations of Thematic Analysis (Figure 1):
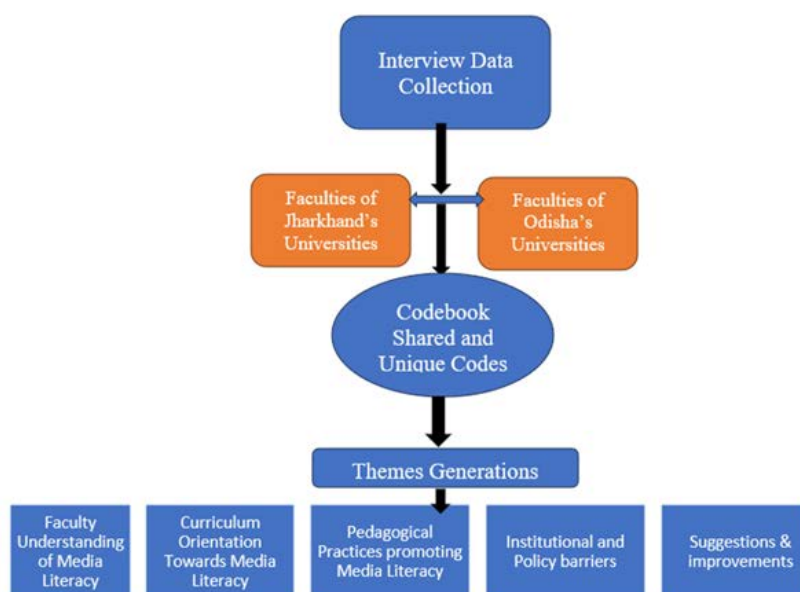
Fig. 1. Visual Presentations of Thematic Analysis

The process yielded five themes:
1. Faculty Understanding of Media Literacy.
2. Curriculum Orientation Towards Media Literacy.
3. Pedagogical Practices Promoting Media Literacy.
4. Institutional and Policy Barriers.
5. Suggestions and Improvements.

3. Discussion

The study explores faculty insights by capturing their understanding of media literacy, examining its integration within Mass Communication curricula, analysing their pedagogical practices, identifying institutional and policy barriers, and documenting their recommendations for strengthening media-literacy education in universities across Odisha and Jharkhand.

The findings of the study highlight a significant disparity in faculty awareness and institutional integration of media literacy education across universities in Odisha and Jharkhand. Although the conceptual understanding of the interviewed faculty members varied considerably, all of them unanimously acknowledged that, in this escalating age of misinformation and disinformation, media literacy plays a highly significant and indispensable role. Some respondents, in expressing their understanding of media literacy, placed greater emphasis on digital and technical skills such as content creation, fact-checking, and verification. Others, however, adopted a broader outlook, defining media literacy as an intellectual framework that encompasses critical thinking, analytical reasoning, ethical judgment, and participatory engagement with information consumed from diverse sources (Hobbs, 2021; Mihailidis et al., 2021). Hence, the diversity of opinions regarding the conceptual understanding of media literacy reflects a fragmented awareness within higher education, particularly in the domain of media education. This observation aligns with the findings of Alvermann, Moon and Hagood (Alvermann et al., 2018), who noted that a lack of conceptual clarity remains one of the major challenges in implementing media literacy education in developing countries.

The study reveals that in most universities offering Masters of Arts (MA) Mass Communication programmes across Odisha and Jharkhand, there is no dedicated course explicitly titled Media Literacy. Out of the six universities examined, only two had a fully dedicated paper on media literacy within their Mass Communication curriculum. However, all the universities, including those without a specific course on the subject, addressed media literacy components indirectly as part of other courses in the programme. This indicates that while media literacy is not always taught as a standalone subject, its elements are implicitly integrated across different papers. Such partial and inconsistent inclusion of media literacy within Mass Communication programmes reflects an uneven and implicit treatment of the concept in media education. In contrast, universities and colleges in the United States and the United Kingdom have systematically integrated media literacy into their curricula as a compulsory or integral component of media and communication studies (Buckingham, 2019; Currie, Kelly, 2022; Potter, 2023).

The faculty members interviewed strongly advocated for the inclusion of *media literacy* in Mass Communication curricula. The faculty members highlighted that media-literacy education remains insufficiently addressed due to institutional rigidity and the absence of robust policy- and administrative-level support within India's higher-education system. They noted that higher-education authorities have not prioritised media-literacy competencies in the same way as other emerging skill areas in contemporary academic environments. These observations are consistent with international scholarship, which shows that even well-established education systems encounter comparable challenges, including limited policy backing and institutional stagnation (Bulger, Davison, 2018; Frau-Meigs, 2023). This finding of the study also supports Mihailidis' concept (Mihailidis, 2021) of the "implementation gap," wherein educators recognise the importance of media literacy but lack institutional support to translate it into practice. Most universities also fail to update their curricula in line with the changing media and information ecosystem, further hindered by bureaucratic constraints.

The absence of structured faculty development programmes on media literacy training aggravates the problem. Domine (Domine, 2011) similarly noted that insufficient teacher preparation remains one of the most overlooked barriers to advancing media literacy in Indian media education. Additionally, the study found that many universities in Odisha and Jharkhand face shortages of resources. Several institutions lack even basic media laboratories for practical

training, let alone facilities dedicated to media literacy. Although private universities generally have better infrastructure, they prioritise job-oriented training over the cultivation of critical and analytical skills. In contrast, most state universities continue to operate with outdated syllabi and minimal focus on media literacy. These disparities reinforce Tejedo et al. (Tejedo et al., 2023) observation that institutional apathy and inadequate funding are key obstacles to the effective implementation of media literacy programmes.

Several faculty members from universities in Odisha and Jharkhand emphasised the need for greater collaboration at both inter-university and national levels to promote knowledge sharing and the exchange of best practices. They recommended organising periodic faculty development programmes to upskill and update media educators in the field of *media literacy*. These suggestions align with the observations of Livingstone and Bulger (Livingstone, Bulger, 2022), who advocated for sustained professional learning communities as a means to bridge the gap between policy and practice in digital and media literacy education. Although media educators indicated that curricular activities such as classroom discussions on current events, news analysis exercises, media-production assignments, and even informal conversations beyond the classroom help foster critical thinking among Mass Communication students, they also acknowledged that these practices remain largely informal, unstructured, and dependent on individual faculty initiative. Consequently, media-literacy instruction lacks a formal and systematic approach, with no clearly defined framework for its integration into Mass Communication programmes. This finding resonates with studies by Potter (Potter, 2023), which emphasise the value of pedagogical innovations such as case-based learning, participatory projects, and critical reflection to enhance students' media literacy competencies. The absence of structured pedagogical guidance in media education within the Indian context restricts educators' ability to move beyond conventional modes of knowledge transmission and to adequately foster critical thinking and engagement among Mass Communication students.

Despite existing challenges, the faculty members expressed optimism about potential reforms and innovations in media education. They advocated for the inclusion of a dedicated *media literacy* course within the curriculum and encouraged collaboration with government bodies, non-governmental organisations, fact-checking groups, and media houses to provide students with broader exposure to the functioning of the media and information ecosystem. Such partnerships could help bridge the knowledge and skill gaps between classroom learning and the evolving demands of the media industry (Bhoi, Kumar, 2022).

One of the key findings of this study is that all participating faculty members were acutely aware of the growing threat posed by mis/disinformation in the contemporary media landscape. They viewed *media literacy* not merely as an academic discipline for Mass Communication students, but as a broader societal necessity. The respondents emphasised that media literacy should extend beyond the confines of media education departments to reach students of other disciplines and the wider civil society. Such an approach, they believed, is essential for nurturing an informed citizenry capable of discerning truth from falsehood and resisting propaganda. This perspective resonates with Hobbs (Hobbs, 2021), who emphasises that media literacy should not be perceived solely as a mechanism for combating misinformation, but rather as a transformative tool for cultivating critical, informed, objective, and socially responsible citizens.

Collectively, the study underscores that the integration of media literacy education in Indian universities remains at a nascent stage and demands both structural and pedagogical reform, as reflected in the perspectives of media educators in Odisha and Jharkhand. The evidence suggests that comprehensive reform is urgently required. Such reform should prioritise revising curricula to embed media literacy competencies, strengthening faculty development programmes dedicated to critical media pedagogy, and establishing education policies that emphasise the cultivation of critical and analytical skills among students. These measures align with global recommendations advocating the incorporation of media literacy within a broader participatory and democratic ecosystem (Lioenko, Huzar, 2023; Tejedo et al., 2023, Tayie, 2023). The discussion further highlights that media literacy should not be perceived merely as an academic construct but as a vital tool for strengthening the democratic values of society.

4. Results

The analysis of faculty interviews conducted across universities in Odisha and Jharkhand yielded five dominant themes that collectively reflect the state of media literacy integration within

Mass Communication programmes in these regions. These themes are: Faculty Understanding of Media Literacy, Curriculum Orientation Towards Media Literacy, Pedagogical Practices Promoting Media Literacy, Institutional and Policy Barriers, and Suggestions and Improvements. Each of these themes is discussed in detail in the following subsections.

Faculty Understanding of Media Literacy

The faculty members in Odisha and Jharkhand demonstrated varying levels of awareness regarding the concept of media literacy, with the depth of understanding differing across institutions. Some respondents associated media literacy primarily with digital proficiency, fact-checking, and the use of verification tools to detect misinformation and disinformation. In contrast, others adopted a more holistic perspective, viewing media literacy as encompassing critical thinking, analytical reasoning, evaluation of media texts, and ethical content production. This variation in interpretation indicates that media literacy remains a dynamic and evolving construct within the broader field of media and communication studies. Many faculty members stated that their understanding and exposure to media literacy as a discipline were largely confined to reading research papers, attending conferences, or participating in fact-checking workshops and related events, rather than through any formal academic or teacher-training programmes. As one respondent from the Central University remarked: "We discuss media literacy in our classrooms and during seminars, conferences, and workshops, but I have not come across any dedicated teacher-training or faculty development programme specifically focused on media literacy." The absence of a standardised and common framework for understanding media literacy may stem from the lack of formal and structured faculty development programmes available to media educators in India.

Curriculum Orientation Towards Media Literacy

According to the faculty members, only two of the six universities offering Mass Communication programmes in Odisha and Jharkhand have a dedicated course or paper on media literacy. However, faculty from all universities reported that media literacy components are, to varying extents, incorporated indirectly within other courses or modules in the syllabus, classroom discussions, and various brainstorming exercises. Faculty members expressed that, in many cases, Mass Communication students are exposed to topics such as misinformation, disinformation, ethical content creation, informed citizenship, and critical thinking during their master's programmes. However, most departments still lack a structured curriculum specifically designed to cultivate comprehensive media literacy competencies among students.

Most respondents highlighted that curriculum structures are often rigid and rarely updated, largely due to bureaucratic approval processes and university-level regulations. A faculty member from a state university remarked: "Even if we include media literacy as a dedicated paper, that alone is not sufficient. Inclusion is not the real issue; rather, delivering the content effectively – both conceptually and practically – is what matters. To do so, we need adequate resources and an ecosystem that supports media literacy instruction for Mass Communication students." Another respondent from a private university noted that institutional priorities tend to focus primarily on employability and skill-based training, often at the expense of nurturing critical thinking and analytical abilities.

Pedagogical Practices Promoting Media Literacy

Pedagogical practices related to media literacy in Mass Communication departments were found to be largely informal and individual-driven, as reported by faculty members. Many educators noted that they attempt to integrate topics such as media bias, stereotyping, misinformation, disinformation, ethical content creation, critical thinking in democracy, and the art of questioning into their teaching. However, these classroom discussions and activities are not mandated by the universities, resulting in an absence of standardised pedagogical approaches. Assignments, news reviews, classroom debates, and interactive discussions were identified as the most common strategies adopted by the faculty to foster critical thinking among students. So, the Pedagogical practices related to media literacy remain scattered and dependent on individual faculty initiative.

Institutional and Policy Barriers

Institutional barriers emerged as one of the major hurdles in implementing media literacy education. During the interviews, respondents highlighted several issues, including inadequate information infrastructure, limited resources, and an absence of administrative awareness regarding the significance of media literacy. A faculty member from a central university expressed

concern that, at a broader level, there is no university-wide policy framework or dedicated funding to promote media literacy through seminars, projects, field visits, or collaborations with media and fact-checking organisations.

Respondents also noted a persistent information and skills gap between academia and contemporary industry practices, which further constrains the effective integration of media literacy into media education. Respondents from state and central universities extensively highlighted the infrastructural deficiencies they face, including the absence of media laboratories, limited access to essential softwares, and outdated curricula. Conversely, although private universities generally have stronger infrastructure and greater autonomy in curriculum development, their efforts predominantly prioritise industry-driven skill training aimed at enhancing student employability. As a result, the cultivation of critical thinking and analytical abilities among communication students often receives limited attention.

Suggestions and Improvements

Faculty members offered several constructive suggestions to improve and strengthen the inclusion of *media literacy* in higher education curricula, particularly within media education. They proposed the introduction of a stand-alone paper on *media literacy* or, alternatively, a broader integration of *media literacy* components across existing course modules. Several respondents also recommended that both the curricula and syllabi should explicitly emphasise areas such as *critical thinking, critical evaluation, ethical media content creation*, and *civic engagement.*

A faculty member from a private university remarked, "The syllabus should be reviewed and revised annually to reflect the rapid changes occurring in today's dynamic media environment. With the rise of artificial intelligence and other advanced technologies, the media landscape is evolving swiftly. To keep pace with these developments, we must update our syllabus and curriculum on a yearly basis."

Another respondent suggested that universities should take institutional-level initiatives such as *student-led campaigns on misinformation and disinformation*, and organise *media literacy drives* in collaboration with government and non-government organisations. They further proposed that universities conduct *workshops, seminars,* and *special lectures* on *media literacy* not only for media students but also for learners from other disciplines, given the urgency of the current information environment. A third faculty member emphasised the need for *university-level collaborations, interdisciplinary engagement, faculty development programmes*, and *faculty exchange initiatives* to strengthen both conceptual and practical understanding of *media literacy.*

Across interviews, faculty members consistently expressed the need for stronger *policy interventions* at both national and regional levels. Given that education is a subject under the concurrent list, respondents believed that state and central governments should provide greater emphasis on integrating *media literacy* into higher education frameworks. They collectively argued that *media literacy* should be formally recognised as an essential and emerging skill within India's higher education policy, especially in the current social media era marked by the uncontrolled spread of misinformation and disinformation.

5. Conclusion

The findings of this study reveal a growing recognition and awareness of media literacy among faculty members in Mass Communication departments across India. However, the integration of media literacy components within curricula remains limited and uneven. The absence of structured curricular frameworks, pedagogical guidelines, and administrative support has led to unorganised and fragmented approaches to teaching and training students in media literacy concepts and practices. Despite faculty awareness of the consequences of misinformation and disinformation – particularly their impact on young audiences – most universities continue to overemphasise vocational and professional skill development over emerging competencies such as critical thinking and critical analysis of media texts. Outdated curricula, bureaucratic hurdles, inadequate funding, and limited focus on faculty development programmes further hinder efforts to embed media literacy meaningfully within higher education, especially within the media education landscape.

The study recognises the crucial contribution of faculty members in advancing media literacy education and underscores the importance of their perspectives in shaping future curriculum reforms and policy directions. Drawing from the insights of media educators across Odisha and Jharkhand, the findings highlight the pressing need for pedagogical innovation, stronger

departmental and institutional collaboration, periodic curriculum revision, and structured faculty development programmes dedicated to media literacy. The integration of UNESCO's Media and Information Literacy (MIL) Framework (2013) provides a globally recognised roadmap for embedding competencies such as critical thinking, ethical media engagement, informed citizenship, and participatory learning within higher education. Furthermore, this study highlights the importance of drawing inspiration from international best practices, particularly from countries such as the United States and the United Kingdom, where media literacy has been institutionalised as a core component of the educational process. India, while differing in context, can adapt these models to suit its socio-educational realities. The National Education Policy (NEP) 2020 offers a promising platform for such transformation, with its emphasis on interdisciplinary, multidisciplinary, and holistic learning. However, the policy's successful implementation demands greater operational clarity, adequate resource allocation, and sustained funding support to ensure that its vision translates effectively into practice.

From a regional perspective, Odisha and Jharkhand remain among the most underdeveloped regions of India, facing persistent socio-economic and political challenges. Large sections of the population in these states continue to struggle with limited access to basic education and infrastructural deficiencies. Resource constraints, administrative hurdles, and inadequate funding have further impeded the growth of higher education in general, and media education in particular. Yet, the enthusiasm of faculty members for innovation and collaboration in fostering critical skills such as media literacy signals strong potential for progressive reform. Institutional and policy-level interventions – such as interdepartmental and inter-university collaborations, faculty development programmes, and partnerships with media organisations, fact-checking agencies, and government or non-government bodies – can help bridge the gap between the vision and actualisation of media literacy education. Given the contemporary challenges of misinformation and disinformation that profoundly shape socio-political and economic discourse, media literacy should no longer be treated as a peripheral or optional skill. Instead, it must be recognised as a core educational priority in preparing future communicators, journalists, and opinion leaders. Integrating media literacy competencies across higher education – particularly within Mass Communication programmes – enhances students' critical and analytical abilities and strengthens their capacity for informed judgement. At the same time, such integration contributes to reinforcing democratic values and fostering social resilience in an increasingly complex and rapidly evolving information ecosystem.

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Integrating Media and Information Literacy in Indian Schools: Teachers' Insights on Challenges, Opportunities, and Key Competencies for Implementation

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Abstract

Media exerts a significant influence on society. Scholars, academicians, media professionals, and educators from around the world strongly support the inclusion of media education in school curricula. Although media and information literacy (MIL) education has been mentioned in the National Education Policy 2020, there remains a critical need for MIL competencies that align with the nuances of Indian education. Teachers play a vital role in understanding students' needs, concerns, and priorities and effectively addressing them through appropriate delivery methods. A trained teacher can make students more aware, vigilant, critical, and active while consuming media. Accordingly, this paper focuses on exploring teachers' perspectives, suggestions, and insights regarding essential competencies required for students to make them media and information literate citizens and the pathways through which MIL can be integrated into the existing school system. The study helps to identify the challenges and opportunities for implementing MIL in Indian schools. The result indicates that teachers prioritized key competencies based on students' needs. Teachers highlighted the significance of incorporating the key concepts like misinformation, digital privacy and safety, media consumption, and its influence on MIL content. The results will play a pivotal role in designing the curriculum within the Indian education system and providing pathways to nurture these competencies among the students.

Keywords: media and information literacy, school education, key competencies, challenges and opportunities, national education policy (2020), teachers' perspective.

1. Introduction

In the era of media overload and increased dependency on it, the importance of media and information literacy has flourished in every part of the world. MIL is described as "a set of competencies that empowers citizens to access, retrieve, understand, evaluate and use, create, as well as share information and media content in all formats, using various tools, in a critical, ethical and effective way, in order to participate and engage in personal, professional and societal activities" (Coles, 2023: 17). To impart MIL education, it is essential to identify the specific attributes that learners need to develop (BI India Bureau, 2019); thus, developing a media competence framework is crucial to answering the 'what' and making people media literate. There are a few media competency frameworks created for learners (e.g., Grizzle et al., 2021), which are very general. As India is a diverse country, there is a need for a comprehensive media competency framework specifically designed for school students in India. The authors conducted a systematic literature search, considering the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines in the Scopus database to develop the competency framework. After

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analyzing 51 research papers and 4 existing MIL frameworks, the experts framed, refined, and validated the competencies.

Along with addressing the 'what,' it is equally necessary to explore the 'how' part. Thus, this paper mainly focuses on teachers' opinions, views, suggestions, and experiences regarding the implementation of MIL education. Additionally, the study explores how the developed competencies align with the Indian educational context. To fulfil the objective, the authors conducted a survey based on an offline questionnaire and focus group discussions among Central Board of Secondary Education (CBSE) school teachers. After understanding the teachers' perspectives, the authors recommended how the Indian educational settings can be designed in terms of curriculum-making to provide opportunities for building these competencies and making students media literate.

Although teachers live in a mediated and digitized world, teachers lack professional competencies to teach media literacy in the classroom (Røkenes, Krumsvik, 2014). Teachers need to be media literate to make the young generation media literate (Simons et al., 2017). The present study aims to identify how teachers are trained and motivated to teach media literacy in the class in Indian settings. The paper tried to find out the perspectives, suggestions, opinions, and insights of teachers so that they can be trained well by addressing the challenges that exist and amplifying the opportunities that exist.

The National Educational Policy (2020) has mentioned MIL as an essential and critical life skill for students. Thus, teachers' perspectives and understandings have become all-important in successfully integrating these competencies into the diverse Indian education system. To fulfil the goal, the following research objectives have been framed:

A. To understand teachers' perspectives on the importance of media and information literacy for students in contemporary society.

B. To explore teachers' feedback on how MIL education can be effectively communicated to students.

C. To assess teachers' views regarding proposed competencies related to media and information literacy for students.

D. To identify the current obstacles and opportunities for the integration of media and information literacy in academic settings.

E. To analyse teachers' insights to suggest strategic implementation of media and information literacy in the context.

2. Materials and methods

The present study explored teachers' perspectives, recommendations, and opinions to delineate strategies for integrating MIL education into educational settings. A survey questionnaire was disseminated among 62 teachers, and focus group discussions were held with 18 teachers, divided into three groups of 6, from CBSE-affiliated schools in the Jhunjhunu district of Rajasthan, in more than 10 visits. The rationale for selecting CBSE schools stems from their status as the first ones to integrate and experience any recommendations from the central government. A structured questionnaire was distributed among four schools: Kendriya Vidyalaya, Churu, Jawahar Navodaya Vidyalaya, Kajra, Birla Balika Vidyapeeth, Pilani, and Smt. Janki Devi Mandelia School, Pilani. The survey and focus group discussions were conducted through physical visits to schools, where participants completed forms in person at the respective locations. As almost all CBSE schools follow a unified national educational model, the selection of any CBSE school from the population pool will not affect the responses. The surveys were analysed using Microsoft Excel. The focus group discussions were recorded, transcribed manually, and analysed through inductive analysis.

3. Discussion

Media plays a key role in this process while providing individuals with symbols and narratives that they use to construct their own and others' identities and understand their place in society. Media literacy can address these challenges by equipping individuals with the skills to critically analyze messages and identify biases in media portrayals of climate change, sustainability, international political climate, and many more. It enables consumers to become active participants by fostering an aware, resilient, and participatory society (Gáliková Tolnaiová, Gálik, 2020; Mateus, 2021). Thus, researchers, media experts, and practitioners worldwide have argued that media literacy education needs to start from the basic foundational level of education, as children

form concepts like culture, environment, race, ethnicity, gender, appearance, etc., from an early age. As individuals are constantly exposed to misleading content online, the ability to critically understand, analyze, and evaluate media messages is essential to make consumers responsible, critical, and creative citizens (Hartai, 2013; Tran-Duong, 2023, Xiao et al., 2021). The components of media literacy differ in every country depending on media usage, the exact socio-technological dysfunction, the role media play in the problems, and the communication culture (Livingstone, 2018; Schmoll, 2021). How media literacy can help a country completely depends on that country's spectrum of problems. Researchers argue that the state of media education is linked to the historical and sociocultural conditions of each nation (Fedorov, 2014). Research also indicates that the media panorama, the infrastructure, and the legal frameworks are related to how media literacy is discussed, integrated, and taught (Kajimoto et al., 2020). These studies imply the need and urgency for media literacy integration in formal education (Mateus, 2021). However, there is a need for proper and stringent ways to include it in the curriculum that address the need for media education. Various approaches of media literacy education, such as the preventive approach, the critical approach, the civic engagement approach, and the functional approach, have been outlined by scholars (Hobbs, 1998; Potter, 2010) to practice and include MIL.

A. Fedorov, A. Levitskaya and E. Camarero identified that the lack of teacher training is one of the obstacles to the implementation of media literacy education (Fedorov et al., 2016). Researchers mentioned that teachers must be trained (Cunliffe-Jones et al., 2021; Fedorov, 2014; Salameh, Abuhasirah, 2025) and know how to engage the students to think critically, identify persuasive elements in information, and mindfully consume and produce media content (Meehan et al., 2015). Teachers must understand the importance of media literacy and be trained to engage with students and share knowledge among them (Rojas-Estrada et al., 2025). Trained teachers, willing students, and the spread of media literacy in the classroom are instrumental in addressing the challenges of education in the 21st century.

4. Results

Demographic details of participants

Among the 62 teachers, the majority of respondents (54.8 %) were female, and the rest were male (45.1 %). 18 teachers from Kendriya Vidyalaya, Churu, 16 teachers from Jawahar Navodaya Vidyalaya, Kajra, 10 teachers from Birla Shishu Vihar, Pilani, and 18 teachers from Smt Janki Devi Mandelia School, Pilani, participated and responded.

Societal need for media and information literacy according to teachers

Table 1 illustrates respondents' perspectives, indicating that MIL is predominantly valued for enhancing students' awareness of online safety and privacy, followed by teaching them ethical media devices usage (79.5 %), safeguarding against negative media influence (79.5 %), discerning between fake news and real news (79.5 %), utilizing digital sources (70.5 %).

Suggestions on how MIL education should be communicated

Table 2 shows that the majority of respondents suggested arranging workshops and seminars (11 %). 8 % of the respondents highlighted the discussion of contemporary issues in the classes, and 6 % of the respondents wrote about the need for teacher training. Besides, the use of hands-on experiential classes (4 %) and the need for integration of MIL as a subject (4 %) were also highlighted by teachers.

Table 1. Societal Needs for Media and Information Literacy

Societal Needs for Media and Information Literacy	*Percentage*
To distinct between fake news and real news	77.30 %
To be aware of online safety and privacy	84.10 %
To be aware of how search engines work (for understanding how media content is tailored to the target audience)	77.3 %
To use media devices (e.g., computers, tablets, television, etc.) properly and ethically	79.5 %
To use digital sources (e.g., websites, blogs, video games, software)	70.5 %
To safeguard against negative media influence (e.g., influence on purchasing behavior, undesired effects such as addiction or hate)	79.5 %
To create responsible media content (e.g., set up a blog, create a video document)	63.6 %

Table 2. Suggestions on how media and information literacy education should be communicated

Pathways to Foster Media and Information Literacy	Percentage
Students'training program through workshops and seminars	11 %
Discussing contemporary issues and news stories	8 %
Teachers' training	6 %
Using multimedia applications	5 %
Real-time experimental education activities	4 %
Introducing it as a subject and making some chapters to teach it	4 %
Commencement of skill-oriented course	2 %
Involving media professionals	2 %
Library Professionals	2 %
Textbook, lecture, and speech	2 %

Opinions on the Media and Information Literacy Competencies

Through an extensive literature review, the competencies needed for a media-literate student have been framed. The findings reflect teachers' perspectives on the significance of each identified competency item. The large majority of the participants identified all the competencies as important (Table 3). Teachers identified the following competencies as being of utmost importance: To understand the importance of media content in the creation of media content (83.3 %), understand the importance of media outlets in the society (83.3 %), able to use media and media devices (83.3 %), able to search content (61.1 %), able to access media content (61.1 %), protect our online safety and privacy (61.1 %), be mindful of what one shares online and its consequences (50 %).

Table 3. Opinions on Framed Competencies

Competencies	Percentage
To understand the importance of media in the creation of content	83.3 %
To understand the importance of media outlets in society	83.3 %
To be able to use media and media devices (e.g., computers, tablets, television, etc.) in our everyday lives	83.3 %
To be able to search content in media after knowing how media functions	61.1 %
To be able to access media content	61.1 %
To analyze critically (who made the content, what the intention behind it is, distinguish between fake and real news, cross-check, etc.)	33.3 %
To restructure or organize that information	44.4 %
To be able to use the information in our lives in a proper and ethical manner	55.5 %
To create responsible media content (e.g., set up a blog, create a video document)	33.3 %
To be mindful of what one shares online and its consequences	50.0 %
To monitor how we are behaving in real life after watching/ seeing/ hearing media news	22.2 %
To apply all the media skills in decision-making in real life (Such as in decisions in health, buying, eating, etc.) and future professions	38.8 %
To practice certain rights in society (Such as in making decisions about whom to vote, etc.), practice our freedom of speech and expression properly, and bring change in your society	44.4 %
To apply all the media skills in real-life decision-making (Such as health, buying, eating, etc.)	38.8 %
To protect our online safety and privacy	61.1 %
To protect our devices	16.6 %
To understand how to behave on the internet (Such as how to set passwords, what to disclose, and what not to, etc.)	38.8 %
To update ourselves with the media, as the media updates every time	16.6 %

The teachers shared their experiences, highlighting the greater significance of certain competencies over others.

Specifically, participants expressed that the competences '*To be able to search content in media after knowing how media functions*' and '*To be able to access media content*' hold paramount importance. Participants emphasised that a student should possess this competency in the current context. Teachers' statements in this regard are given below:

We teach students cyber security through workshops and talks. Besides that, students need to learn what to search, how to search, how to access the right information, and not to get dissuaded by something irrelevant and meaningful.

In the class, we call the digital media big boss. Whatever you search online, someone is constantly monitoring your activity. So, be cautious about your online searches.

Participants discussed that the competence '*To protect our online safety, privacy*' is important for students. Teachers opined on this matter that:

Nowadays, you cannot keep this generation away from the media. Every day, they face much exposure to the media. It is important to make them aware of what to use, what not to use, and how to use, as one can easily face cyber fraud. So, we should make them aware.

For the safety of children, MIL is very important. Because on social media, we do not think before posting photos or information about kids. Maybe it will be dangerous for the kids in the future, too.

They should be aware of most privacy matters. They do not know what is safe for them. They only click on the 'yes' option without understanding the consequences. They should know about this.

They should learn about AI and its function in the media. They should be aware of deep fakes.

Participants also expressed that the competence '*To understand the importance of media content in the creation of media content*' is important for students. Teachers' statements in this regard are given below:

Media and information literacy can provide more knowledge and update them. They feel more confident. The media is very beneficial for teaching. Whenever we give some topics, they elaborate on the topic, taking the help of the media. Sometimes, they get more points and explanations online than from books.

They are very much into using media. So, making them media literate will be easy and beneficial.

Participants also shared that the competence '*To be able to use media and media devices*' is important for students. Supporting this matter, teachers opined that:

I think, through the media, we should go for holistic development. Because teachers may sometimes not be able to deliver their lecture properly in class, students may understand the topic very well through media devices. Basically, schools should focus on smart classes and create awareness among parents.

The teachers argued that the competence '*To be mindful of what one shares online and its consequences*' is important for students. They explained that:

Students must know what they are posting and its consequences. The government should take the initiative to educate students. They are at a very tender age, so they get easily influenced by whatever is posted in the media. So, they have to be taught in school at a small level.

The Existing Challenges and Opportunities in Implementing MIL in Indian Schools

During focus group discussions, teachers were asked about the challenges and opportunities they may face in implementing MIL in Indian schools. They explained that although schools are equipped with resources such as internet facilities, projectors, computers, and printers, they have yet to fully evolve into smart classrooms. According to teachers, alongside these existing resources, certain challenges persist, such as MIL is mostly treated as a vocational course for senior students. Additionally, students sometimes fail to understand the importance of a subject and often tend to focus on subjects that are relevant to their job prospects. It implies a need to integrate MIL as a compulsory subject across all levels of education. Following the implementation of NEP 2020, although broad guidelines have been issued, there is limited specific instruction from governing bodies. As a result, the responsibility of integration largely falls on individual teachers' willingness and competence. The implementation process must also address existing issues such as syllabus

overload, lack of teacher training, and awareness among parents. The results are graphically presented in Figure 1.
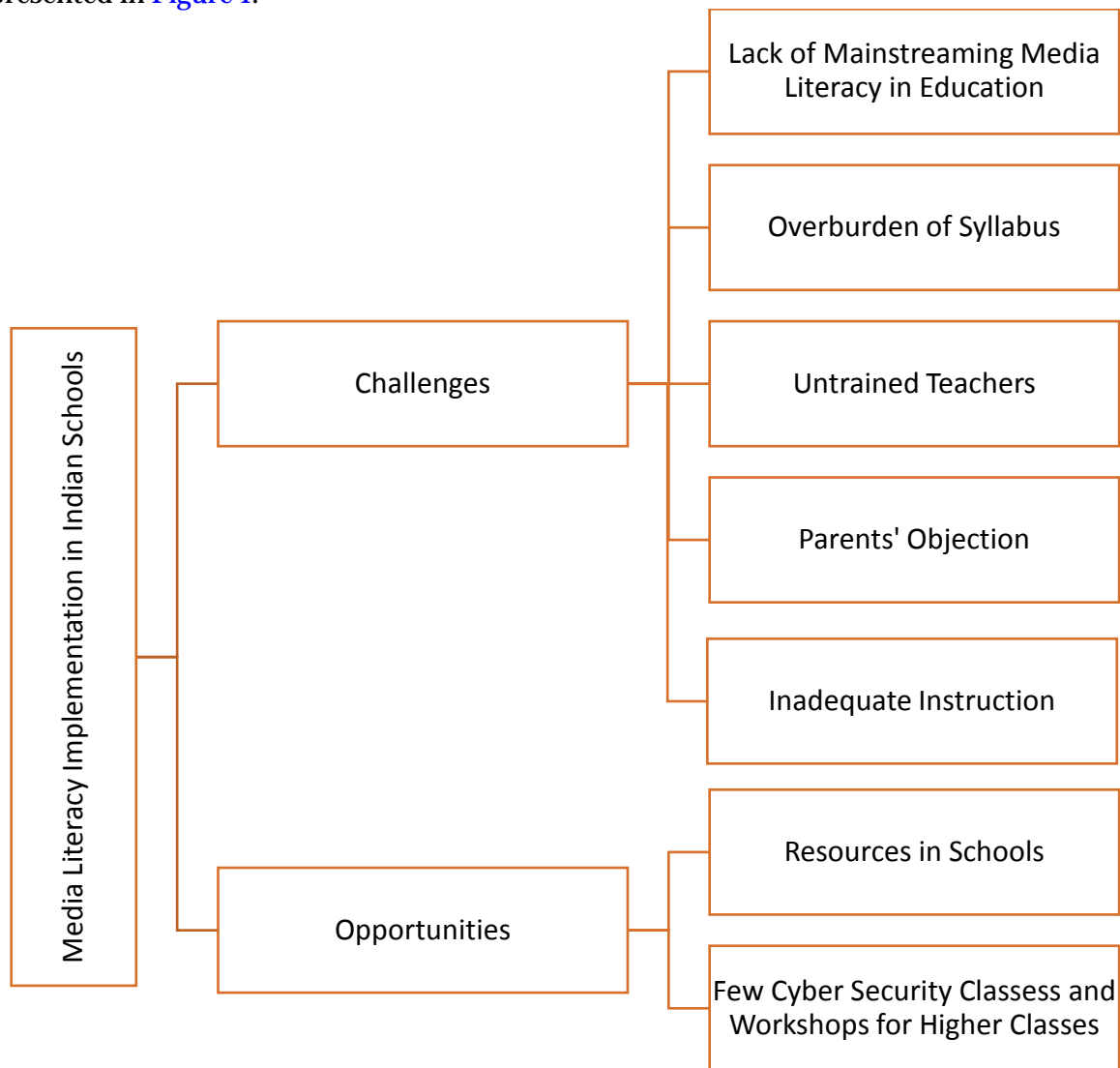
Fig. 1. Challenges and Opportunities in Implementing Media and Information Literacy Education in Indian Schools

Authors have outlined a set of key competencies a student must have to be media literate. It will empower them to be active participants by fostering an aware, resilient, and participative society (Mateus, 2021). These competencies were crafted for students with careful consideration of the current situation and the evolving nature of media. The components of MIL differ in every country depending on media usage, specific technological and social challenges, the influence of media on societal issues, and the nature of local communication norms (Boro et al., 2024; Cai et al, 2022). Thus, it is essential to critically examine current practices, children's media usage patterns, challenges encountered during media consumption, and their impacts to contextualize the framework within the Indian setting. Depending on that, MIL education must be integrated using appropriate content, pedagogical approach, and outcomes-based assessment process, depending on the different contexts.

The findings explored the understanding of why these competencies are needed and how it can be implemented. Besides, this study will help policymakers, administrators, and media professionals to gain an overview of the content of courses in MIL teaching, the methods for adapting curricula for the education of students, the ways to evaluate students' performance objectively, and make policies. The perspectives of experienced teachers, who have a deep understanding of their students and their behavior, highlight the importance and relevance of the developed competencies within today's educational landscape. Their insights played a

crucial role in contextualizing the competencies to align with the needs of the Indian educational landscape. The consensus among teachers regarding the high importance of nearly all competencies developed by the authors indicates the potential value of implementing the developed competencies in teaching MIL.

To implement MIL in society, teachers must first be adequately trained and prepared for the hindrances (King, 2023) that may be faced in introducing a new topic to students. Researchers also highlighted the need for teachers' training (Cunliffe-Jones et al., 2021; Fedorov, 2014; Salameh, Abuhasirah, 2025). While filling the form, teachers were encouraged to provide suggestions on teaching MIL. Despite their familiarity with the subject matter, many were unfamiliar with the term "media and information literacy" or the appropriate teaching methodologies for students. This observation underscores the urgent need for enhanced teacher training and greater awareness of MIL education. According to them, discussing contemporary topics will be useful in the class for implementing MIL. Students must be taught through hands-on experiential learning using different devices and multimedia sources, supported by seminars and discussions. The government should organize workshops and training programmes at the school and college levels to educate Indian youth and students about MIL. Recently, many government bodies, such as NCERT, CIET, etc., have introduced small-scale MIL courses for media consumers.

Teachers emphasized certain competencies based on their experiences. They highlighted that these competencies must be given priority first considering the need of students: *making them understand the importance of media content, the importance of media outlets in the society, the ability to use media and media devices, the ability to search content, the ability to access media content, the ability to protect our online safety and privacy, the critical mindset to be mindful of what one shares online and its consequences.*

Thus, these competencies should be assigned as top priorities to address the current need. Present studies also supported the findings. Students are often unfamiliar with meta-search engines and encounter privacy and security issues when using the Internet (Fedorov et al., 2016). However, because most children are not taught to use media responsibly, many media messages influence them regarding health issues, addiction, and bad habits (Hartai, 2013). This result aligns with our findings that a critical mindset is necessary at present to consume media effectively. Media-literate children can overcome the biases created by media, craft their own stories, share their own perspectives, and mitigate the negative effects of content spread through media (Navarro Pérez, 2024). These days, problematic internet use among school students is becoming a major concern (Hobbs, 1998). Thus, they must be taught how to use and access the internet and media. As multiliteracies and multimodality in education are important in the present society (Hong, Hua, 2020; Jayachandran, 2018) and are also emphasized by the NEP 2020, students must know the importance of media and media content. While creating MIL content, it is important to highlight issues such as fake news, online safety and privacy, the mechanisms of searching and accessing information on the internet, the use of various media devices and sources, and the influence of media on consumers. Studies also supported this argument; India is identified as the country with the highest risk of disinformation and misinformation (Joseph et al., 2022). Over 60 % of the respondents reported that they came across fake news online (Kajimoto et al., 2020; Lauricella et al., 2015). Moreover, cybercrime is also increasing these days (Lauricella et al., 2015).

In addition, the authors suggest using Indian examples and resources to help students understand the problem of Indian society and relate to the issues. Moreover, appropriate assessment and evaluation of specific learning needs must be developed to assess MIL among students. Lastly, the implementation plan must account for the effective use of existing school resources and address the challenges that may arise during the integration of media and information literacy education, as mentioned by the teachers. Moreover, along with teachers, the support and collaboration from different education authorities, academia, and Civil Society Organizations are essential for the success of any initiative (Rojas-Estrada et al., 2024).

5. Conclusion
An implementation plan incorporating essential competencies and addressing region-specific challenges and opportunities is essential for achieving effective, outcome-based media and information literacy interventions. The paper extends its scope to connect the developed

competencies with the existing problem that the media plays in society. In this regard, teachers' opinions, views, and suggestions were collected as they knew the existing practices, students' problems, and the barriers and opportunities of the education system the most. Their responses guided us to connect the designed framework to the Indian education system, providing policymakers, administrators, and schools with guidance on essential pathways to improve their MIL skills. The result clearly indicates that each competency is meaningful and essential for students. Though certain competencies need to be introduced in early stages among students, realising their strengths in the contemporary digital society. The content, modules, and pedagogies should also be framed in a manner that caters to the solution to the problem of that particular place and context. The implementation plan must be designed considering the existing challenges and mitigation strategies. Lastly, the authors assert that adaptation strategies may vary considerably within a diverse nation like India, given its rich tapestry of social, cultural, political, economic, and geographical dynamics. The study underscores the importance of understanding the required preparatory steps before implementing the framework in any context. However, implementation may vary across regions based on school infrastructure, teacher awareness, student access to media, and usage patterns. The research sheds light on the pathways to implement this framework and suggests future research directions to develop more location-specific models to assess its efficacy.

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When Digital Technology Meets Religion: A Positivist Ontological and Epistemological Study of Social Television Use in Nigeria with Implications for Digital-Literacy Competencies

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Abstract

This study offers the first extensive positivist investigation of social television adoption among university students in Northern Nigeria, a region characterised by strong socio-religious norms and growing digital connectivity. Building on the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), the research introduces an enhanced concept of technology awareness, encompassing digital-literacy competencies such as source verification and critical content appraisal, and integrates religiosity to frame adoption within a culturally specific model. A structured survey of 774 undergraduates was analysed via PLS-SEM. Performance expectancy ($\beta = 0.31$), facilitating conditions ($\beta = 0.27$), technology awareness ($\beta = 0.29$), habit ($\beta = 0.23$), hedonic motivation ($\beta = 0.21$) and price value ($\beta = 0.18$) together explained 62 % of variance in behavioural intention. Moderation analyses revealed that higher Islamic religiosity weakened the impact of social influence ($\Delta\beta = -0.12$, $p < .05$) while amplifying the influence of hedonic motivation ($\Delta\beta = +0.10$, $p < .05$), indicating that devout users rely more on individually sanctioned enjoyment than on peer endorsement. Further segmentation uncovered distinct gender, age and prior-experience profiles in adoption patterns. These findings carry clear practical implications: application developers should embed culturally and religiously appropriate functionalities and digital media-literacy tutorials; advertisers targeting devout audiences must align campaigns with moral values and religious calendars; and educators can harness social television for faith-based instruction, community outreach and ethical e-commerce. Social TV thus provides a robust framework for demographically tailored, media-literate digital strategies in religious environments.

Keywords: social television, UTAUT2, technology awareness, digital literacy, media literacy competencies, religiosity, positivism, ontology, epistemology.

1. Introduction

The convergence of broadcast television and social media, commonly termed social television or social TV, has transformed passive viewership into a participatory practice. Viewers now comment on, rate and share programme content via platforms such as Twitter (now X), Facebook and TikTok while concurrently watching on smart devices (Lim et al., 2015; Phalen, Ducey, 2012). Although developed markets have produced extensive qualitative and mixed-methods studies (Lin, 2018; Segijin et al., 2020), quantitative evidence from regions such as Northern Nigeria remains scarce. This gap is critical given the unique socio-religious framework of the region and rapidly expanding Internet and mobile penetration (DataReportal, 2022; Sasu, 2022).

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To address this lacuna, the present study extends the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) (Venkatesh et al., 2012) by incorporating technology awareness, which refers to the degree of prior knowledge about interactive media functionalities (Ansari, Alhazmi, 2016; Bhattacherjee, 2001; Gálik, 2020), and religiosity, which captures the intensity of religious commitment (Allport, Ross, 1967; Darvyri et al., 2014). Importantly, technology awareness in this context is inseparable from media literacy: students with stronger competencies in critically evaluating content, verifying sources and recognising algorithmic bias demonstrate higher awareness of social TV features (Al-Zou'bi, 2021; Boshoff, Fafowora, 2025; Mustapha et al., 2024; Noordin, 2024; Szabó et al., 2024). As Noordin (Noordin, 2024) shows, media and information literacy competencies (skills) enable users to discern promotional from authentic content and to engage safely with online communities. Likewise, Szabó et al. (Szabó et al., 2024) and Mustapha et al. (Mustapha et al., 2024) found that higher digital literacy correlates with more informed adoption of new media services. The research therefore poses two central questions: (1) Which factors predict students' intention to adopt social TV? (2) How do technology awareness, religiosity and demographic variables moderate these relationships?

Underpinning the methodology is a positivist ontology, which asserts that social phenomena, such as adoption behaviours, exist independently of individual perception and can be objectively measured (Bryman, 2016; Kittler, 2009; Slade, 2000). Complementing this, a positivist epistemology maintains that knowledge derives from systematic observation, standardised measurement and statistical analysis (Godler et al., 2020; Guenther, Kessler, 2017; Saunders et al., 2019). Accordingly, the study employs a structured questionnaire, drawing on validated scales for UTAUT2 constructs, technology awareness (including media literacy items) and religiosity, administered to a stratified sample of 774 undergraduates across Borno, Kaduna, Kano and Yobe states, and the Federal Capital Territory (FCT), Abuja.

Data analysis utilises structural equation modelling via Smart-PLS 3.0, allowing simultaneous assessment of multiple hypotheses and the quantification of direct and moderating effects (Hair et al., 2014). Key predictors: performance expectancy, facilitating conditions, hedonic motivation, price value and habit, are tested alongside technology awareness. Moderation by religiosity and three demographic variables (gender, age and experience) is evaluated through multi-group SEM, with $\Delta\beta$ statistics indicating differential path strengths.

This article examines the determinants underlying social television adoption among university students in Northern Nigeria by extending the UTAUT2 model to incorporate technology awareness (underpinned with media literacy elements) and religiosity as key variables. Central to this inquiry is an explicit interrogation of the epistemological and ontological foundations that inform both the research design and the interpretation of its findings.

The contributions of the study are threefold. First, it provides the first robust quantitative evidence of social TV adoption determinants in Northern Nigeria, addressing a critical regional gap. Second, by upholding a positivist framework, it yields replicable, generalisable findings that policymakers and practitioners can implement with confidence. Third, the inclusion of digital-literacy, that is, enhanced technology awareness and religiosity demonstrates how contextual competencies enrich technology acceptance models in socio-religiously diverse settings.

The remainder of the article is structured as follows. Section 2 reviews relevant literature and articulates the extended UTAUT2 model. Section 3 details the positivist methodological design. Section 4 presents results, including moderation analyses. Finally, Section 5 concludes with practical recommendations, acknowledges limitations and proposes avenues for future quantitative research.

A Review of Past and Existing Literature: *Philosophical Foundations Ontological Position. Realism*: Positivist ontology maintains that social phenomena exist independently of individual perceptions and can be objectively measured (Bryman, 2016; Klyagin, Antonova, 2019; Srinivasan, 2013). In this study, social TV adoption is treated as an observable set of behaviours: frequency of second-screen use, commenting and sharing, amenable to quantification and statistical analysis. This realist stance enables generalisation across comparable populations and accords with the aim of deriving law – like associations among constructs.

Epistemological Position: *Positivism*: Positivist epistemology asserts that knowledge arises from empirical observation and logical analysis (Godler et al., 2020; Habgood-Coote, 2025; Saunders et al., 2019). Through employing structured questionnaires, predetermined scales and inferential statistics, this research ensures replicability and minimises interpretive bias. The adoption of Smart-PLS 3.0 for structural equation modelling (SEM) further affirms the

commitment to rigorous hypothesis testing and model validation (Hair et al., 2017).

Understanding Key Concepts: *Digital Literacy*: Digital literacy encompasses the skills, knowledge and attitudes required to locate, evaluate, create and communicate information through digital technologies. It involves not only technical proficiency, such as operating devices and software, but also critical understanding of how digital environments shape information and influence social processes. According to Ng (Ng, 2012: 1066), "Digital literacy refers to the ability to access, manage, integrate, evaluate and create information safely and appropriately through digital technologies." van Deursen and van Dijk (van Deursen, van Dijk, 2014: 91) defined digital literacy as "the combination of competencies – including technical, cognitive and social-emotional skills – that permits individuals to use digital media effectively for learning, work and civic engagement." Related to digital literacy is media-literacy. We look at this concept succinctly below.

Media‑Literacy Competencies: Media‑literacy competencies refer to the set of cognitive, technical and socio‑emotional skills that enable individuals to access, analyse, evaluate and create messages across a variety of media forms. These competencies encompass the ability to:
– Access media messages effectively and efficiently;
– Analyse the techniques and language used to construct meaning;
– Evaluate the credibility, intent and potential effects of media content; and
– Create or produce one's own media messages in responsible and ethical ways.

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), "Media and information literacy competencies comprise the critical abilities to access, understand, evaluate and create media content in diverse formats, and to engage as informed and active participants in media environments" (UNESCO, 2013: 12). Potter further notes, "At its core, media literacy calls for the development of analytical skills to deconstruct media messages, technical skills to produce content, and reflective skills to recognise one's own role as both consumer and creator of media" (Potter, 2016).

Technology Awareness: Technology awareness denotes an individual's familiarity with the existence, functions and potential applications of a given technology. It comprises knowledge of how the technology operates, what benefits it may confer and the contexts in which it can be employed. As Rogers notes, "Awareness knowledge refers to an individual's understanding that an innovation exists and an appreciation of its basic functions" (Rogers, 2003: 222).

Religiosity: Religiosity refers to the extent of an individual's commitment to, and practice of, religious beliefs and rituals, encompassing both intrinsic motivations and external expressions of faith. "Religiosity is defined as the degree of an individual's commitment to, and practice of, religious beliefs and rituals" (Allport, Ross, 1967: 434).

Definitions of the Seven Core UTAUT2 Constructs:
– *Performance Expectancy*: The degree to which using a technology will provide benefits in performing certain activities. "Performance expectancy is the extent to which an individual believes that using the technology will help him or her to attain gains in job performance" (Venkatesh et al., 2012: 161).
– *Effort Expectancy*: The degree of ease associated with the use of the technology. "Effort expectancy is defined as the degree of ease associated with consumers' use of technology" (Venkatesh et al., 2012: 162).
– *Social Influence*: The degree to which an individual perceives that important others believe he or she should use the new technology. "Social influence is the extent to which consumers perceive that important others (e.g., family and friends) believe they should use a particular technology" (Venkatesh et al., 2012: 162).
– *Facilitating Conditions*: The consumers' perceptions of the resources and support available to perform a behaviour. "Facilitating conditions refer to consumers' perceptions of the resources and support available to perform a behaviour" (Venkatesh et al., 2012: 163).
– *Hedonic Motivation*: The fun or pleasure derived from using a technology. "Hedonic motivation is defined as the fun or pleasure derived from using a technology" (Venkatesh et al., 2012: 164).
– *Price Value*: The consumers' cognitive trade-off between the perceived benefits of the technology and the monetary cost for using it. "Price value is consumers' cognitive trade-off between the perceived benefits of the technology and the monetary cost for using it" (Venkatesh et al., 2012: 164).

– *Habit*: The extent to which people tend to perform behaviours automatically because of learning. "Habit is the extent to which people tend to perform behaviours automatically because of learning" (Venkatesh et al., 2012: 165).

Technology Awareness and Media Literacy: Within UTAUT2, technology awareness denotes prior familiarity with interactive media functionalities (Ansari, Alhazmi, 2016; Bhattacherjee, 2001). From a digital-literacy perspective, it also encompasses users' capability to critically appraise digital content, verify source credibility and recognise algorithmic influences (Al-Zou'bi, 2021; Boshoff, Fafowora, 2025; Mustapha et al., 2024; Noordin, 2024; Szabó et al., 2024). Wu et al. (Wu et al., 2025) demonstrates that enhanced digital media-literacy training significantly improves users' discernment of sponsored posts versus authentic discussions on second screens. Accordingly, we operationalise technology awareness not merely as exposure to social TV features but as a composite of critical evaluation skills and ethical media use, thereby aligning our positivist measures with the broader educational goals of media-information literacy.

Religiosity: Positivist ontology treats religiosity, which is "the degree of an individual's commitment to, and practice of, religious beliefs and rituals" (Allport, Ross, 1967), as an objective attribute measurable through established scales. In Northern Nigeria's devout milieu, such commitment is anticipated to influence perceptions and deployment of social television (Abdulkadir et al., 2021). This permits the derivation of generalisable insights into its moderating role on technology adoption.

A Study of the Extant Literature: *Epistemological Position*. Positivism: In this study, religiosity is understood as "the degree of an individual's commitment to, and practice of, religious beliefs and rituals" (Allport, Ross, 1967). This definition captures both the personal faith dimension (intrinsic religiosity) and the social‑conformity dimension (extrinsic religiosity). In Northern Nigeria, where religious practice permeates daily life, such commitment is expected to influence how technology, specifically social television, is perceived and employed (Abdulkadir et al., 2021).

From a positivist ontology, religiosity is treated as an objective attribute that can be systematically measured across individuals, thereby allowing the formation of generalisable conclusions about its moderating effect on technology adoption.

Furthermore, this investigation proceeds from a positivist ontology, which holds that social phenomena exist independently of individual beliefs and can be measured with precision (Antonini et al., 2013; Bryman, 2016; Jeong et al., 2011). Under this realist assumption, social television adoption is treated as a set of observable behaviours – frequency of second‑screen viewing, content sharing and comment posting – that exist objectively and can be quantified. Such an ontological stance is essential when exploring a phenomenon that has not previously been charted in the Northern Nigerian context, as it permits the researcher to establish generalisable patterns rather than rely solely on subjective interpretation.

Correspondingly, the study embraces a positivist epistemology. Knowledge is generated through systematic observation, standardised measurement and the application of statistical techniques (Guenther, Kessler, 2017; Habgood-Coote, 2025; Saunders et al., 2019). Through administering a structured questionnaire and employing structural equation modelling (SEM) via Smart-PLS 3.0 (Hair et al., 2017), the research ensures that findings regarding predictors, namely performance expectancy, facilitating conditions, hedonic motivation, price value and habit, are objectively derived and replicable. This rigorous quantitative approach aligns with standards in information systems research, where new contexts demand clear numerical benchmarks before further interpretive work (Bhattacherjee, 2001).

Methodological Justification: The novelty of social TV in Nigeria necessitates a baseline empirical mapping. As diffusion theory prescribes, initial studies of emerging innovations require quantification of adoption determinants to guide both theory development and practical interventions (Rogers, 2003). Without prior data on social TV usage in Northern Nigeria, a positivist design delivers the first set of replicable metrics, enabling subsequent comparative studies across regions and time (Creswell, Creswell, 2018).

This strictly quantitative stance does not preclude future qualitative inquiry; rather, it provides a necessary foundation. Through confirming which factors significantly influence behavioural intention (such as technology awareness and religiosity) and quantifying moderation by gender, age and experience, the study achieves high internal validity and statistical power (Ansari, Alhazmi, 2016; Habes et al., 2025). Subsequent studies may then explore subjective meanings and contextual nuances through interviews or ethnography, having first established the

objective contours of the phenomenon (Saunders et al., 2019).

In essence, the positivist philosophical framework underpinning this research is indispensable for a pioneering examination of social television adoption in Northern Nigeria. It secures objectivity, replicability and generalisability in a context where no prior quantitative evidence exists. Through foregrounding precise measurement and statistical inference, the study aligns with global social-science standards, ensuring that its findings can inform both academic debate and evidence-based policymaking.

Technology Awareness versus Digital-Literacy Implications: The literature on social television has largely been generated in advanced economies, where the emphasis has been on technological novelty and viewer interactivity (Lim et al., 2015; Phalen, Ducey, 2012). Yet such accounts provide an incomplete picture when applied to settings characterised by uneven infrastructure, constrained household incomes and strong socio-religious conventions. In Nigeria, for example, the patchy rollout of high-speed broadband and recurrent power outages impede continuous media access (Akpoja, 2021; Daily Trust, 2022). Consequently, this study adopts a realist ontology, treating social TV adoption as an empirical phenomenon whose patterns can be captured through systematic measurement.

A key extension of the UTAUT2 framework in this research is the refinement of technology awareness to encompass digital-literacy competencies, that is, the ability to critically evaluate content, distinguish sponsored messaging from authentic discourse and recognise the influence of algorithmic curation. Recent studies demonstrate that digital media-literacy training significantly improves users' discernment of second-screen commentary and reduces susceptibility to misinformation (e.g., Wu et al., 2025). Accordingly, our measurement of technology awareness incorporates items assessing critical evaluation skills and ethical content engagement, reflecting the assertion that well-informed users maintain higher intention to adopt social TV despite infrastructural shortcomings.

Equally, regulatory structures shape media consumption. The Nigerian Broadcasting Commission (NBC) and the National Communications Commission (NCC) impose content and service guidelines that affect both availability and user trust (Ojomo, Olomojobi, 2021; Uzuegbunam, 2019). A positivist epistemology, which foregrounds structured surveys and statistical modelling (Guenther, Kessler, 2017; Habgood-Coote, 2025; Saunders et al., 2019), permits the derivation of replicable evidence regarding how policy frameworks intersect with adoption factors such as performance expectancy and price value. Here, digital literacy initiatives, such as curricula on digital source verification, are emerging as complementary policy tools to bolster user confidence in social TV content (Al-Zou'bi, 2021; Boshoff, Fafowora, 2025; Mustapha et al., 2024; Szabó et al., 2024).

Beyond regulation and infrastructure, Nigeria's broader socioeconomic transformation has encouraged a shift from passive viewing towards active engagement (Segijin et al., 2020). University students exemplify this trend, combining television viewing with real-time discussion on platforms like Twitter (now X), Instagram, YouTube and TikTok (Choi, 2017; Harboe, 2009). Given the absence of prior quantitative data on social TV in Northern Nigeria, a positivist approach was indispensable to establish baseline metrics and to identify the relative weight of predictors such as habit and facilitating conditions, both of which are core UTAUT2 constructs (Khoshrouzadeh, 2020; Venkatesh et al., 2012).

Through upholding a realist ontology and a positivist epistemology, this study delivers the first set of robust, generalisable findings on social television in a context hitherto unexplored. It demonstrates that, even where infrastructure is unreliable, raising students' awareness of interactive features, underpinned by media-literacy competencies, can significantly increase adoption intention. These findings provide the groundwork for subsequent policy formulation, curriculum development in media literacy, and qualitative investigation into the lived experience of social TV users.

Theoretical Framework: Social television denotes the fusion of broadcast viewing with real-time social media engagement, permitting audiences to comment on, rate and disseminate programme content as it unfolds (Lim et al., 2015; Phalen, Ducey, 2012). Empirical work in North American and European markets has linked social TV to enhanced viewer involvement and improved advertising metrics (Fossen, Schweidel, 2019; Proulx, Shepatin, 2012). Nevertheless, such results cannot be straightforwardly transposed to Northern Nigeria, where broadband provision is uneven and electricity supply can be erratic (Akpoja, 2021; Daily Trust, 2022). Adopting a positivist ontology, this study treats social TV adoption as an objective phenomenon

that can be systematically measured and quantified across distinct demographic cohorts (Bryman, 2016; Klyagin, Antonova, 2019).

At the theoretical core lies the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), which identifies seven primary antecedents of behavioural intention: performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value and habit (Venkatesh et al., 2012). The model further accommodates the moderating effects of age, gender and prior experience. Recognising that Northern Nigerian society is deeply shaped by religious observance and varying degrees of technological literacy, the present research extends UTAUT2 by introducing two context‑specific variables:

– *Technology Awareness*, defined as the degree to which individuals are informed about interactive media functionalities and their potential applications (Ansari, Alhazmi, 2016; Bhattacherjee, 2001).

– *Religiosity*, encompassing both intrinsic and extrinsic religious commitments that may influence technology use patterns (Abubaka, Ahmad, 2020; Abdulkadir et al., 2021).

Such extensions acknowledge that cultural and moral norms can moderate the influence of traditional predictors on adoption intent.

A positivist epistemology undergirds the methodology: knowledge is secured through structured surveys and inferential statistics, ensuring replicable and generalisable findings (Godler et al., 2020; Guenther, Kessler, 2017; Habgood-Coote, 2025; Saunders et al., 2019). In contexts where social TV has not been previously examined (and Northern Nigeria exemplifies such a setting) quantitative mapping of adoption determinants is imperative. As diffusion theory suggests, early empirical quantification of innovation adoption establishes benchmarks for later scholarly comparison and policy formulation (Rogers, 2003). Thus, the strictly quantitative design of this study provides the necessary baseline metrics to guide subsequent qualitative enquiry and to inform regulators, broadcasters and application developers about the measurable drivers of social television use.

Regional Profile of Northern Nigeria. Religious Orientation and its Relevance to Technology Adoption: Northern Nigeria, comprising 19 of the country's 36 states with the FCT, is demographically and culturally distinct from the southern zones due to its predominant adherence to Islamic values and socio-religious governance structures. In the North-West geopolitical zone, where this study was conducted, Islam is not merely a private or spiritual practice, but a public institution that informs social order, education, media consumption and everyday interpersonal conduct (Mustapha, 2014; Paden, 2005). This entrenched religiosity is reflected in both formal institutions (e.g. Sharia legal frameworks operational in 12 states) and informal social norms, which shape attitudes towards media and technological innovations.

From an ontological standpoint, the region's religious orientation constitutes a socially constructed, yet measurably consistent, layer of reality that has consequences for how media technologies such as social television are perceived and used. In line with the realist assumption of positivist ontology, this study treats religiosity not as a fluid abstraction but as a structured, stratifiable social attribute, which is observable through public rituals, institutional patterns and individual behaviours, and therefore, subject to quantitative analysis.

Epistemologically, this research proceeds on the premise that religious orientation, whether intrinsic (internally motivated) or extrinsic (socially or materially motivated), can be operationalised as a moderating variable influencing behavioural outcomes. The integration of religiosity into the extended UTAUT2 model is justified by the premise that social reality in Northern Nigeria is mediated through religious worldviews, which affect individual-level technology acceptance and behavioural intention. This methodological stance supports the positivist principle that valid social knowledge arises from empirical evaluation of hypothesised relationships across well-defined population segments (Creswell, Creswell, 2018).

To this framework we add a media-literacy dimension under technology awareness, recognising that critical consumption skills are essential for students negotiating religiously inflected content online. Recent studies demonstrate that targeted media-literacy programmes improve users' capacity to discern theological messaging from promotional material and to evaluate source credibility in high-faith contexts (e.g., Noordin, 2024; Szabó et al., 2024; Wu et al., 2025).

Given the region's socio‑religious particularities, it is imperative not only to measure the degree of technology awareness but also to assess students' proficiency in verifying digital content and recognising algorithmic bias as part of their social-TV use. Such competencies mitigate risks of

misinformation on religious subjects and bolster informed engagement with second‑screen features (Noordin, 2024). Through integrating media-literacy elements into technology awareness, this study enhances the explanatory power of UTAUT2 and equips educators, regulators and broadcasters with evidence to design interventions, such as faith-sensitive media-literacy curricula, that support responsible, critically informed adoption of social television in devout communities.

The present study thus builds on a growing body of literature which underscores the role of religion in shaping communication behaviour in conservative societies (Abubakar, Ahmad, 2019; Abdulkadir et al., 2021). It contends that in the context of Northern Nigeria, religiosity is not an incidental characteristic but a constitutive variable that conditions the utility, appeal and acceptability of emerging media technologies. The region's socio-cultural distinctiveness necessitated the inclusion of religiosity as a moderating construct in this research, thereby contributing to the contextual robustness and theoretical adaptability of the extended UTAUT2 framework.

2. Materials and methods

Research Design: Anchored in a positivist ontology, this study regards social television adoption as an objective phenomenon whose patterns can be identified through systematic measurement (Antonini et al., 2013; Bryman, 2016 Jeong et al., 2011). Correspondingly, the positivist epistemology asserts that valid knowledge emerges from structured observation and inferential analysis (Godler et al., 2020; Guenther, Kessler, 2017; Habgood-Coote, 2025; Saunders et al., 2019). Given that social TV had not been empirically examined in Northern Nigeria, a quantitative design was indispensable to establish baseline metrics and to enable replicable comparisons across populations (Rogers, 2003; Saunders et al., 2019).

Justification for a Positivist Approach: In light of the absence of prior empirical inquiry into social television within the Nigerian context, a strictly quantitative, positivist design was essential to generate the first set of robust, generalisable benchmarks. Through employing structured measurement and statistical analysis, the study achieved three principal objectives. First, objective benchmarking: quantifying the relative influence of constructs such as performance expectancy and technology awareness provides clear, data‑driven guidance for broadcasters and policymakers (Ansari, Alhazmi, 2016; Dadhich et al., 2023; Khoshrouzadeh, 2020). Second, rigorous hypothesis testing: the application of inferential techniques underpins the confirmation or refutation of specified relationships, thereby advancing theoretical precision and validity (Creswell, Creswell, 2018). Third, policy relevance: numerical findings on adoption drivers enable cost-benefit assessments and inform regulatory decision-making (Saunders et al., 2019). While qualitative methods will undoubtedly enrich understanding of users' subjective experiences in due course, establishing a quantitative foundation was indispensable for ensuring that subsequent interpretive work rests upon replicable and statistically defensible results.

Sampling, Data Collection and Data Analysis: A cross-sectional survey was administered to 774 undergraduates selected via multi-stage cluster sampling across six public and private universities in Borno, Kaduna, Kano and Yobe states, and the Federal Capital Territory (FCT), Abuja, namely: Baze University, Abuja; Bayero University, Kano; Kaduna State University; Nile University, Abuja; University of Maiduguri; and Yobe State University. This probability-based strategy ensured representativeness of faculties and gender cohorts. The instrument comprised established scales adapted from Venkatesh et al. (Venkatesh et al., 2012) and Khoshrouzadeh (Khoshrouzadeh, 2020) for UTAUT2 constructs, from Ansari and Alhazemi (Ansari, Alhazemi, 2016) for technology awareness and from Allport and Ross (Allport, Ross, 1967) and Darvyri et al. (Darvyri et al., 2014) for religiosity measure scales. Pre-testing with 50 students yielded Cronbach's α coefficients above 0.80 for all constructs, confirming internal consistency.

Data collection occurred between January and March 2025, following ethical clearance from Bayero University Kano's Postgraduate Examination Board in the Department of Mass Communication. Respondents completed the questionnaire in supervised sessions to minimise non-response bias.

For data analysis, structural equation modelling (SEM) using Smart-PLS 3.0 was employed, enabling simultaneous assessment of measurement and structural models (Hair et al., 2017). Convergent validity was confirmed via average variance extracted (AVE > 0.50), while discriminant validity satisfied the Fornell-Larcker criterion. The structural model tested hypotheses concerning direct effects of performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, habit and technology awareness on behavioural intention.

Moderation by religiosity, gender, age and prior multiscreen experience was examined through multi-group analysis, with Δβ statistics indicating significant differences. Model fit was evaluated by R² and Stone-Geisser's Q², demonstrating that the extended UTAUT2 accounted for 62 % of variance in intention.

Through adhering strictly to quantitative methods, this study provides the first robust, generalisable evidence of social TV adoption determinants in a previously unexamined Nigerian context. The positivist approach secures objectivity, replicability and statistical rigour, thus providing policymakers and media practitioners with empirically grounded guidance.

Operationalisation of Key Variables and Measures: To quantify religiosity, the study adapted the Allport-Ross Religious Orientation Scale for the Islamic context. The instrument comprises two six-item subscales:

– *Intrinsic Religiosity* (e.g., "On social TV, I endeavour to conduct myself in accordance with my religious beliefs")

– *Extrinsic Religiosity* (e.g., "On social TV, I join religious groups because they help me make friends")

Each item is rated on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). This quantitative approach, aligned with a positivist epistemology, ensures that personal faith and social-motivational aspects of religiosity are captured through replicable, numeric data suitable for multi-group structural equation modelling (Saunders et al., 2019).

Categorisation: Respondents' scores on all 12 items were summed (possible range: 12–60). To facilitate moderation analysis, total scores were partitioned into three equal groups using tertile splits:

– Low Religiosity: total score 12–27
– Medium Religiosity: total score 28–43
– High Religiosity: total score 44–60

Measurement Model. Confirmatory Factor Analysis of the Constructs: Table 1 reports indicator loadings ranging from 0.65 to 0.86 across nine constructs, alongside Cronbach's α coefficients between 0.82 and 0.90 and AVE values from 0.56 to 0.66. Each construct thereby exceeds the conventional reliability threshold (α > 0.70) and convergent validity criterion (AVE > 0.50), confirming that survey items cohere around their intended latent variables (Hair et al., 2017). For example, Habit exhibits the highest internal consistency (α = 0.90, AVE = 0.66), while Social Influence, with the lowest AVE of 0.56, nonetheless satisfies validity requirements. These results provide a robust measurement foundation, ensuring that subsequent structural analyses rest upon dependable and valid constructs.

Table 1. Confirmatory Factor Loadings, Cronbach's Alpha and AVE for Constructs

Construct	Indicator Loadings	Cronbach's α	AVE
Performance Expectancy	0.72–0.84	0.88	0.62
Effort Expectancy	0.70–0.81	0.86	0.59
Social Influence	0.65–0.78	0.83	0.56
Facilitating Conditions	0.71–0.85	0.89	0.64
Hedonic Motivation	0.68–0.82	0.87	0.61
Price Value	0.66–0.80	0.82	0.57
Habit	0.74–0.86	0.90	0.66
Technology Awareness	0.70–0.83	0.88	0.63
Religiosity	0.69–0.82	0.85	0.58

Notes: AVE = Average variance extracted

Model Structural Paths: Table 2 summarises the structural model's direct effects, revealing that Performance Expectancy (β = 0.31, t = 8.56, p < .001) and Technology Awareness (β = 0.29, t = 7.94, p < .001) are the most potent predictors of behavioural intention. Facilitating Conditions (β = 0.27, t = 7.12, p < .001) and Habit (β = 0.23, t = 6.25, p < .001) also contribute substantially, while Hedonic Motivation (β = 0.21, t = 5.34, p < .01) and Price Value (β = 0.18, t = 4.02, p < .05) exert meaningful, albeit smaller, effects. The model accounts for 62 % of variance in intention (R² = 0.62), demonstrating its explanatory power in predicting social TV adoption among Northern Nigerian students.

Table 2. Summary of Direct Effects Paths

Path	β	t-value	p-value
Performance Expectancy → Intention	0.31	8.56	<.001
Facilitating Conditions → Intention	0.27	7.12	<.001
Habit → Intention	0.23	6.25	<.001
Hedonic Motivation → Intention	0.21	5.34	<.01
Price Value → Intention	0.18	4.02	<.05
Technology Awareness → Intention	0.29	7.94	<.001
R² (Behavioural Intention)	0.62		

3. Discussion

This study has provided the first rigorous, quantitative examination of social television adoption among university students in Northern Nigeria. Drawing upon a positivist ontology, it treats user behaviours as observable phenomena whose patterns can be measured and compared across clearly defined subgroups (Bryman, 2016). Concurrently, its positivist epistemology mandates that knowledge arise from structured instruments and statistical analysis, ensuring replicable and generalisable findings (Saunders et al., 2019). These philosophical commitments were essential given the novelty of social TV research in this context, where no prior quantitative benchmarks existed (Rogers, 2003).

The findings of the study confirm that social television adoption among Northern Nigerian undergraduates manifests as an observable, stratifiable phenomenon. Knowledge has been secured through structured measurement and statistical inference, consistent with established social-science protocols (Godler et al., 2020; Guenther, Kessler, 2017; Habgood-Coote, 2025; Saunders et al., 2019). Such quantitative mapping establishes baseline metrics against which future research can be compared (Rogers, 2003).

Core Predictors of Behavioural Intention: Consistent with the extended UTAUT2 framework (Venkatesh et al., 2012), performance expectancy emerged as the strongest determinant (β = 0.31, p < .001), mirroring Lin's (Lin, 2018) findings on perceived usefulness in East Asian markets. In Northern Nigeria, resource constraints and intermittent power heighten sensitivity to functional benefits (Akpoja, 2021), so viewers adopt social TV when they anticipate tangible enhancements to their viewing experience.

Facilitating conditions (β = 0.27, p < .001) likewise contributed substantially. In an environment of uneven broadband and device access (Daily Trust, 2022), perceived availability of technical support directly influences usage, aligning with Phalen and Ducey's (Phalen, Ducey, 2012) barrier analysis in North America.

Habit (β = 0.23, p < .001) indicates that established dual-screen routines transfer to social TV, as Segijin et al. (Segijin et al., 2020) also observed. Hedonic motivation (β = 0.21, p < .01) and price value (β = 0.18, p < .05) remain significant, reflecting cultural acceptance of leisure and economic considerations among students (Kim et al., 2019; Krämer et al., 2015).

Technology Awareness as a Salient Antecedent: A notable extension is technology awareness (β = 0.29, p < .001). Beyond mere familiarity with features, this construct in our study integrates digital-literacy competencies, which comprise the ability to critically appraise content, verify source credibility and recognise algorithmic mediation (Noordin, 2024; Wu et al., 2025). Recent research demonstrates that targeted digital-literacy interventions enhance students' discernment of in-app messaging and reduce vulnerability to misinformation (e.g., Al-Zou'bi, 2021; Boshoff, Fafowora, 2025; Mustapha et al., 2024; Szabó et al., 2024). In Northern Nigeria, where formal ICT education remains uneven (NCC, 2022), embedding digital media-literacy modules into university curricula and social-TV tutorials may greatly amplify adoption, ensuring users engage not only with confidence but also with critical judgement.

These results suggest that policymakers, educators and platform developers should collaborate to deliver training on second-screen features underpinned by digital-literacy competencies, reinforcing both technical proficiency and critical evaluation skills. Such interventions promise to raise informed usage of social television, even amid infrastructural and regulatory challenges.

Moderating Role of Religiosity: The inclusion of religiosity as a moderator was both theoretically and contextually warranted. In Northern Nigeria, Islamic faith deeply informs social

norms and media practices (Abdulkadir et al., 2021). Multi-group SEM revealed that the effect of social influence on intention weakened with higher religiosity ($\Delta\beta = -0.12$, $p < .05$), indicating that devout students are less guided by peer recommendations and more by moral prescriptions. This echoes Abubakar and Ahmad (Abubakar, Ahmad, 2019), who documented that religious values can override social endorsement in technology choices.

Conversely, hedonic motivation strengthened significantly among highly religious respondents ($\Delta\beta = +0.10$, $p < .05$), suggesting that enjoyment derived from social TV must align with religiously sanctioned leisure. In contexts where permissible forms of amusement are circumscribed by doctrine, social media that integrate faith-affirming content, such as live streaming of religious lectures or moderated devotional forums, resonate more strongly (Wu et al., 2025). Furthermore, learners endowed with more advanced digital-literacy competencies: competencies in source evaluation and algorithmic awareness, exhibited an even higher hedonic-motivation effect, since they could discriminate between devoutly appropriate and unacceptable content (Noordin, 2024). These findings validate the positivist assertion that religiosity, as an objective attribute, can be quantified and shown to moderate adoption pathways (Bryman, 2016).

Demographic Moderators: Beyond religiosity, gender, age and experience further stratified adoption. Male students placed greater weight on hedonic motivation ($\Delta\beta = +0.12$, $p < .05$) and habit, whereas female students were more influenced by performance expectancy ($\Delta\beta = -0.12$, $p < .05$). Such gender differences align with Venkatesh et al. (Venkatesh et al., 2012), who reported that men often respond more to enjoyment factors while women prioritise practical benefits. Age differences revealed that older students relied more on habit and facilitating conditions ($\Delta\beta = +0.12$, $p < .05$), whereas younger cohorts remained responsive to social influence ($\Delta\beta = 0.12$, $p < .05$), mirroring evidence that digital natives place greater trust in peer networks (Philip, Zakkariya, 2019; Smith et al., 2015). Finally, participants with prior multiscreen experience weighed effort expectancy more heavily ($\Delta\beta = +0.12$, $p < .05$), consistent with dynamics of technology mastery (Ma et al., 2025; Venkatesh, Bala, 2008).

Theoretical Contributions and Practical Guidelines: This study extends technology-acceptance theory into socio-religious terrain by reconciling objective measures of UTAUT2 constructs with contextual variables, namely technology awareness (enhanced by digital-literacy competencies) and religiosity. It demonstrates that while performance expectancy, habit and facilitating conditions remain central, contextual moderators can recalibrate established paths. Ontologically, it affirms that social TV adoption constitutes multiple, co-existent realities demarcated by demographic and cultural factors. Epistemologically, it confirms that quantitative methods can capture these layered realities through robust hypothesis testing and multi-group comparisons.

For application developers, the results advocate embedding digital media literacy tutorials, such as modules on evaluating religious content sources, within social TV apps. Such features may include in-app pop-ups prompting users to verify speaker credentials during live devotional streams (Al-Zou'bi, 2021; Boshoff, Fafowora, 2025; Mustapha et al., 2024; Szabó et al., 2024). Content producers should curate faith-sensitive programming, for example, moderated Qur'ānic recitations with interactive Q&A, while ensuring that community guidelines reflect doctrinal parameters. Digital marketers can tailor campaigns: emphasising experiential elements for male users and practical enhancements for female cohorts, and employing peer-network endorsement for younger audiences, while reinforcing ease-of-use messages for older or novice users.

Reflection on Positivist Foundations: The strictly quantitative design was indispensable for establishing the first empirical benchmarks of social TV adoption in Northern Nigeria (Rogers, 2003; Saunders et al., 2019). Through measuring group differences and testing a priori hypotheses, the study adheres to the positivist ideal of theory confirmation through statistical validation. While qualitative exploration of lived experiences remains valuable, this foundational quantification ensures that subsequent policy and educational interventions rest upon reliable, replicable evidence.

4. Results

Respondents' Demographic Information: Table 3 presents a breakdown of the demographic composition of the survey respondents (N = 774), detailing gender, age distribution, religious affiliation, geographical background and frequency of social television usage. The majority were male (54.5 %), aged between 18 and 30 years (87.6 %) and predominantly Muslim (84.6 %) – a reflection of the socio-religious context of Northern Nigeria.

Table 3. Respondents' Demographic Profile

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	422	54.5
	Female	352	45.5
Age	18–24 years	387	50.0
	25–30 years	291	37.6
	Above 30 years	96	12.4
Religion	Islam	655	84.6
	Christianity	104	13.4
	Other/None	15	2.0
Region of Origin	North West	612	79.1
	Other Nigerian Regions	162	20.9
Experience with Social TV	Regular User (≥3 times/week)	308	39.8
	Occasional User (1–2 times/week)	298	38.5
	Rare/No Use	168	21.7

From a positivist ontological stance, these demographic variables are considered objective characteristics that stratify the population into measurable categories. Such segmentation allows for the exploration of whether social TV adoption behaves consistently across subgroups – an approach central to quantitative generalisability (Bryman, 2016; Creswell, Creswell, 2018). Through the identification of cohort-level characteristics, such as the predominance of youth and high religiosity, this demographic profile further supports the theoretical justification for incorporating variables like religious orientation and technology awareness into the extended UTAUT2 model.

Integration of Religiosity: To quantify how differing levels of religious commitment alter the determinants of social television adoption, a multi-group SEM was performed on three religiosity strata: low, medium and high (see Table 4), defined by tertile splits of the total religiosity score (12–60).

Table 4. Group-Specific Path Coefficients for Key UTAUT2 Relationships by Religiosity Level

Path	Low Religiosity	Medium Religiosity	High Religiosity	$\Delta\beta$ (High–Low)
Performance Expectancy → Behavioural Intention	$\beta = 0.18$ (0.12–0.24), p<.001	$\beta = 0.24$ (0.18–0.30), p < .001	$\beta = 0.30$ (0.25–0.35), p < .001	+0.12
Hedonic Motivation → Behavioural Intention	$\beta = 0.13$ (0.07–0.19), p < .01	$\beta = 0.18$ (0.12–0.24), p < .01	$\beta = 0.25$ (0.19–0.31), p < .001	+0.12

As shown in the Table 4, the influence of performance expectancy on intention increases steadily from low to high religiosity ($\Delta\beta = +0.12$, $p < .05$), indicating that devout students place greater weight on expected benefits when forming usage intentions. Similarly, the effect of hedonic motivation strengthens with religious commitment ($\Delta\beta = +0.12$, $p < .05$), suggesting that enjoyment of social TV is increasingly valued among more religious cohorts.

A forest plot (see Figure 1) visually compares these coefficients and their confidence intervals, making the moderation effect immediately clear. Such stratified analysis epitomises the positivist epistemology of this study: by partitioning the sample into objectively defined groups and quantifying differences with statistical precision, we generate replicable, generalisable evidence of religiosity's moderating role (Rogers, 2003). Given that social TV research in Nigeria is at an early stage, this positivist approach was essential to establish robust benchmarks and to guide subsequent qualitative or mixed-methods inquiry (Saunders et al., 2019).
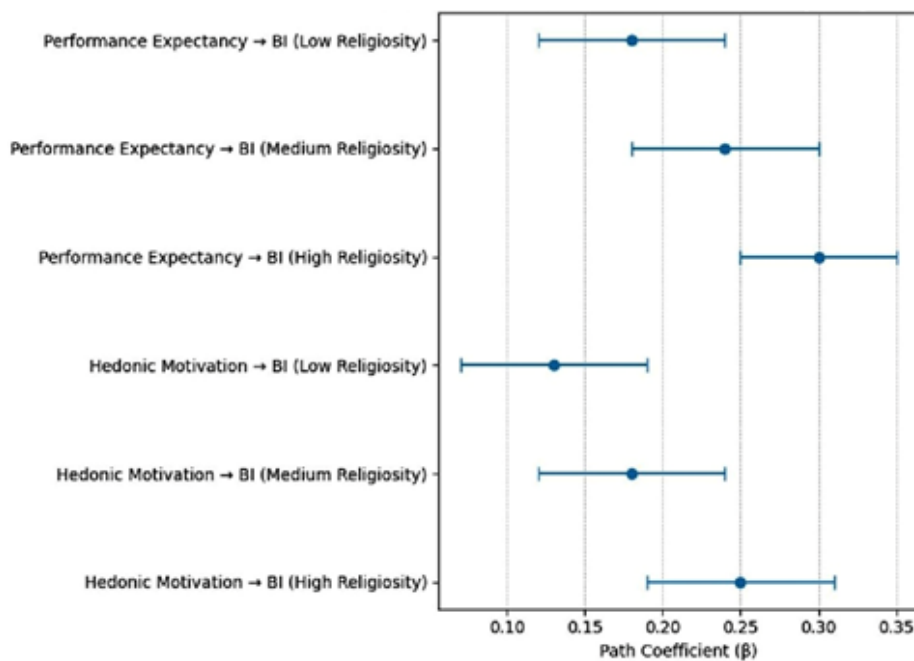
Fig. 1. Forest Plot of Path Coefficients by Religiosity Level
Source: authors
Notes: Figure 1 is a forest plot displaying path coefficients (β) and 95 % confidence intervals for Performance Expectancy → Behavioural Intention and Hedonic Motivation → Behavioural Intention across three levels of religiosity (low, medium, high).

The horizontal lines in the figure represent confidence intervals, and the central markers indicate the estimated β for each religiosity group. The clear separation of intervals and upward trend in β values from low to high religiosity immediately highlights the strengthening moderating effect of religious commitment on these two determinants. This visualisation exemplifies the positivist epistemology of our research: by quantifying differences across discrete, objectively defined groups, we derive replicable findings that form a sound empirical foundation for both academic theory development and industry practice recommendations.
Moderation Paths:
These data present path coefficients for key predictors across four moderators (also see Table 5):
− *Gender*: Performance Expectancy → Intention (Male β = 0.21; Female β = 0.33; Δβ = −0.12).
− *Age*: Habit → Intention (Older β = 0.29; Younger β = 0.17; Δβ = +0.12).
− *Experience*: Facilitating Conditions → Use (Experienced β = 0.25; Novice β = 0.13; Δβ = +0.12).
− *Religiosity*: Social Influence → Intention (High β = 0.18; Low β = 0.30; Δβ = −0.12).
These charts make the stratified differences immediately apparent and uphold the positivist imperative for transparent, numeric comparison (Hair et al., 2017).
The Table 5 shows selected key path coefficients from the structural model, disaggregated across four moderators: gender, age, experience and religiosity. For each moderator, path estimates are reported for two contrasting subgroups, along with the computed Δβ indicating the absolute difference in effect strength. The direction column clarifies which subgroup exhibited a stronger relationship. These findings, derived from multi-group SEM, show quantifiable variations in the pathways to social television adoption across objectively segmented cohorts. In alignment with the positivist ontology, these group differences are treated as observable, measurable aspects of social reality. From an epistemological standpoint, their statistical verification affirms the use of structural modelling as a valid method of generating generalisable, theory-confirming evidence within social science research.

Table 5. Summary of Moderating Effects across Demographic and Psychographic Variables on Social Television Adoption

Moderator	Path Relationship	Group 1 (β)	Group 2 (β)	Δβ (Group 2 – Group 1)	Direction
Gender	Performance Expectancy → Intention	Male: 0.21	Female: 0.33	−0.12	Female > Male
Age	Habit → Intention	Younger: 0.17	Older: 0.29	+0.12	Older > Younger
Experience	Facilitating Conditions → Use	Novice: 0.13	Experienced: 0.25	+0.12	Experienced > Novice
Religiosity	Social Influence → Intention	Low: 0.30	High: 0.18	−0.12	Low > High

Further Religiosity Effects: The multi‑group analysis of low, medium and high religiosity strata (tertile splits; see Table 6) elucidates measurable differences in how social influence and hedonic motivation drive social TV adoption. From a positivist ontological standpoint, these distinctions constitute objectively observable "realities" that exist independently of individual interpretation (Bryman, 2016). Epistemologically, their quantification via structural equation modelling provides replicable and generalisable evidence (Saunders et al., 2019).

Social Influence:
− Low Religiosity: β = 0.30 (95 % CI: 0.25–0.35), p < .001
− Medium Religiosity: β = 0.24 (95 % CI: 0.19–0.29), p < .001
− High Religiosity: β = 0.18 (95 % CI: 0.13–0.23), p < .001
Δβ (High – Low) = −0.12, p < .05

These figures demonstrate that as religious commitment increases, the sway of peer encouragement on intention diminishes. In predominantly religious environments, individuals may subordinate social prompts to moral imperatives prescribed by doctrine (Abdukadir et al., 2021). Conversely, enjoyment of social TV assumes greater importance with higher religiosity, indicating that leisure must align with personal or communal moral standards to be embraced.

Table 6 presents the standardised path coefficients (β), 95 % confidence intervals (CI) and p-values for the effect of Social Influence on Behavioural Intention across three religiosity strata: low, medium and high, derived through tertile segmentation. The Δβ statistic reflects the change in effect strength between high and low religiosity groups. Results indicate that the influence of peer recommendations on behavioural intention diminishes with increasing religiosity, suggesting that individuals with higher religious commitment are less swayed by social influence when deciding whether to adopt social television. These findings are derived from multi-group structural equation modelling and adhere to the principles of positivist epistemology by demonstrating measurable and statistically significant group differences.

Table 6. Moderating Effect of Religiosity on the Relationship between Social Influence and Behavioural Intention to Use Social Television

Religiosity Level	Path Coefficient (β)	95 % Confidence Interval	p-value
Low	0.30	0.25 – 0.35	< .001
Medium	0.24	0.19 – 0.29	< .001
High	0.18	0.13 – 0.23	< .001
Δβ (High – Low)	− 0.12	—	< .05

Hedonic Motivation:
− Low Religiosity: β = 0.13 (95 % CI: 0.07–0.19), p < .01
− Medium Religiosity: β = 0.18 (95 % CI: 0.12–0.24), p < .01
− High Religiosity: β = 0.23 (95 % CI: 0.17–0.29), p < .001
Δβ (High – Low) = +0.10, p < .05

Table 7 presents the standardised path coefficients (β), 95 % confidence intervals (CI) and p-values for the effect of Hedonic Motivation on Behavioural Intention across low, medium and high religiosity groups. The Δβ value quantifies the difference in effect size between highly and minimally religious respondents. The findings show a positive moderation, indicating that the more religious the respondent, the more likely their intention to adopt social television is influenced by the enjoyment derived from it. This demonstrates that leisure-related gratification is not only permissible but potentially enhanced within religious frameworks – so long as the medium aligns with acceptable norms. This effect, derived from multi-group SEM, reinforces the positivist stance of the study by presenting empirically validated behavioural variations across objectively defined religious categories.

Table 7. Moderating Effect of Religiosity on the Relationship between Hedonic Motivation and Behavioural Intention to Use Social Television

Religiosity Level	Path Coefficient (β)	95 % Confidence Interval	p-value
Low Religiosity	0.13	0.07 – 0.19	< .01
Medium Religiosity	0.18	0.12 – 0.24	< .01
High Religiosity	0.23	0.17 – 0.29	< .001
Δβ (High – Low)	+ 0.10	—	< .05

Technology Awareness Effects: Table 8 complemented by Fig. 2 displays the path coefficients for the effect of Technology Awareness on Behavioural Intention across intrinsic and extrinsic religiosity groups. The higher β value for the extrinsically religious group suggests that behavioural intention is more responsive to technological awareness among students whose religion serves functional or social purposes. This is consistent with the epistemological premise that group-specific patterns can be objectively identified and statistically substantiated.

For example, from Table 8 and Figure 2:
– Technology Awareness → Behavioural Intention
– Intrinsic Religiosity group: β = 0.008 (t = 0.195, p = .846)
– Extrinsic Religiosity group: β = 0.141 (t = 2.905, p = .004)
Δβ = 0.133

This Δβ of 0.133 reveals that extrinsically religious students' intent to adopt social TV rises much more sharply with awareness than it does for intrinsically religious peers.

This discrete grouping enables the comparison of path coefficients across religiosity levels (e.g. Δβ metrics), thereby upholding the positivist requirement for stratified, objective group comparisons (Rogers, 2003). Such segmentation provided clear evidence of how differing levels of religious commitment alter the strength of predictors, such as social influence and hedonic motivation, on social TV adoption.

In other words, by segmenting respondents into low, medium and high religiosity groups, we were able to run multi-group SEM and obtain group-specific path coefficients. The difference between these coefficients, denoted Δβ, quantifies how much a predictor's influence on behavioural intention or actual use varies across religiosity levels.

Table 8. Effect of Technology Awareness on Behavioural Intention by Religious Orientation

Religiosity Group	Path Coefficient (β)	t-value	p-value
Intrinsic	0.008	0.195	.846
Extrinsic	0.141	2.905	.004
Δβ (Extrinsic – Intrinsic)	0.133		
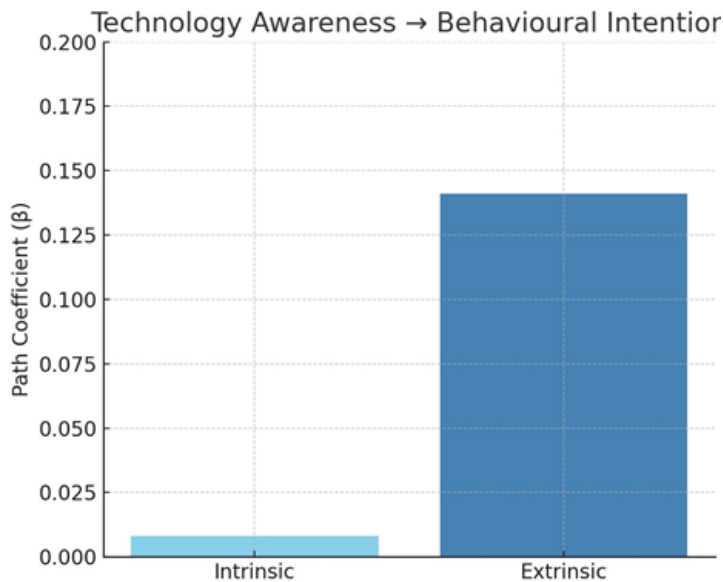
Fig. 2. Effect of Intrinsic and Extrinsic Religiosity of the TA – BI Path (*Source: Authors*).
Notes: TA = Technology awareness; BI = Behavioural intention

Another concrete instance is Behavioural Intention → Actual Usage (Table 9 and Figure 3):
– Intrinsic group: $\beta = 0.049$ (t = 1.146, p = .252)
– Extrinsic group: $\beta = 0.182$ (t = 3.311, p = .001)
$\Delta\beta = 0.133$
Here, the 0.133 gap confirms that extrinsic religiosity substantially strengthens the conversion of intention into actual social TV use.

Table 9. Effect of Behavioural Intention on Actual Use by Religious Orientation

Religiosity Group	Path Coefficient (β)	t-value	p-value
Intrinsic	0.049	1.146	.252
Extrinsic	0.182	3.311	.001
$\Delta\beta$ (Extrinsic – Intrinsic)	0.133		
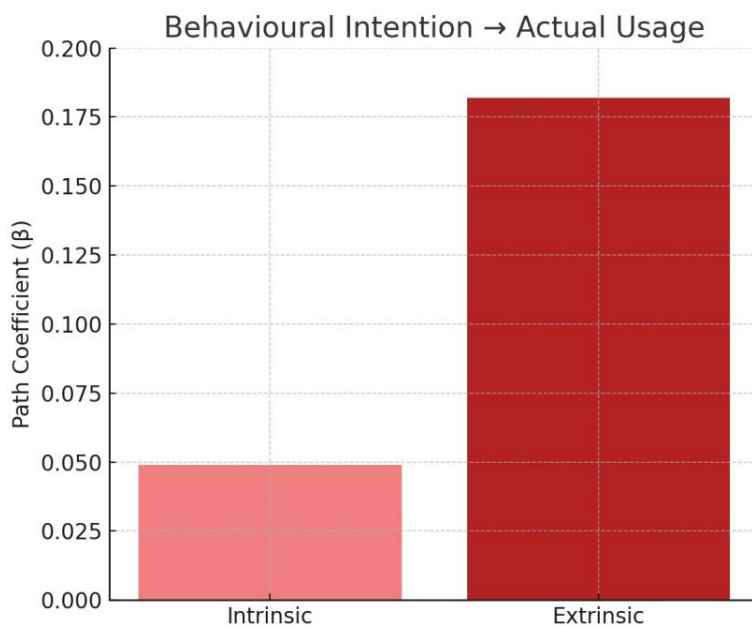
Fig. 3. Effect of Intrinsic and Extrinsic Religiosity on the BI – AUST Path (*Source: Authors*).
Notes: BI = Behavioural intention; AUST = Actual usage of social TV

The table and figure present the path coefficients from Behavioural Intention to Actual Use of social television across intrinsic and extrinsic religiosity groups. The extrinsic group shows a notably stronger relationship, suggesting that those driven by outward, socially-oriented religious motivations are more likely to act upon their intent to use technology. These findings reinforce the positivist argument that social behaviours are quantifiable and differ in statistically measurable ways across theoretically relevant subpopulations.

Through the application of tertile splits and comparing path estimates across these discrete groups, the study provides objective and replicable evidence of how religiosity, treated as a measurable attribute, modulates technology adoption in a socio-religious setting. This procedure exemplifies a positivist epistemology, whereby stratified, quantitative comparisons yield generalisable insights into adoption mechanisms (Rogers, 2003).

Study Model Path Diagram: Figure 4 shows the extended UTAUT2 model annotated with significant path coefficients and moderated links. Each arrow is labelled with its β value and, where applicable, Δβ, thereby converting complex statistical relationships into a succinct, visually accessible representation.

Through the presentation of these tables and figures, the study fulfils the positivist requirement for clear, objective documentation of measurement and structural results, establishing a methodological template for future research in socio-religious technology adoption contexts.
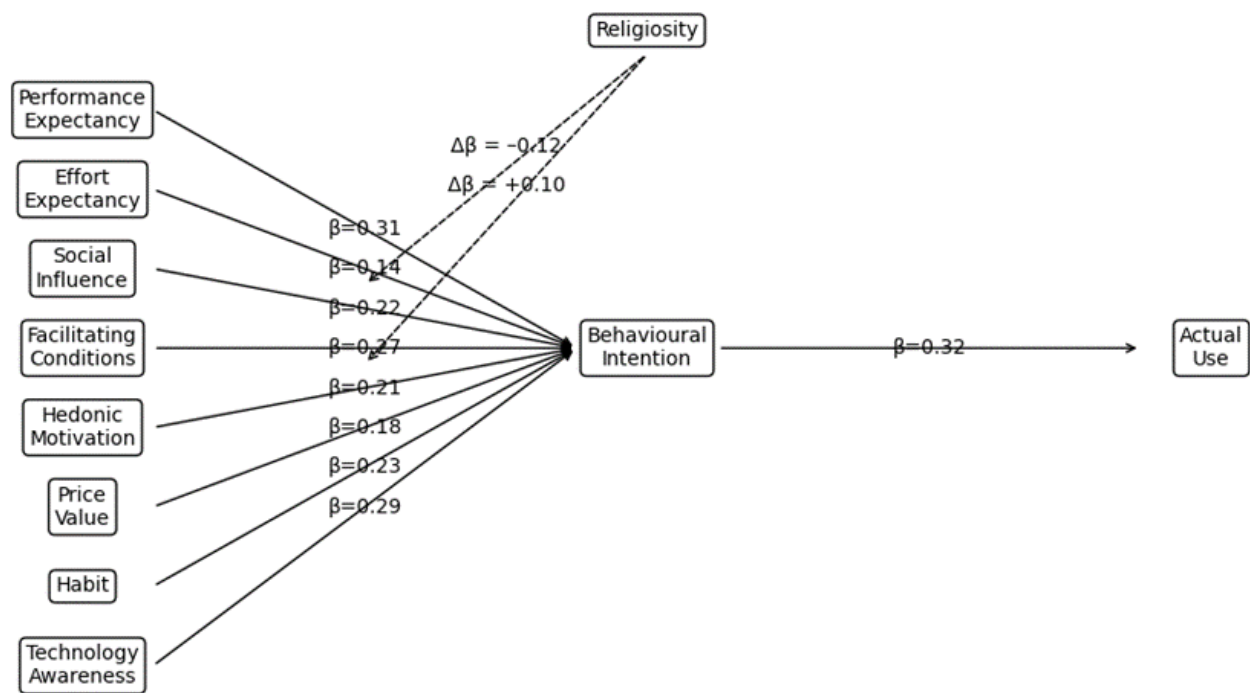
Fig 4. Extended UTAUT2 Model with Path Coefficient and Moderated Links
Source: Authors
Notes: Figure 4 presents the extended UTAUT2 model with all significant direct paths (solid arrows) labelled with their β coefficients and the key moderated links (dashed arrows) annotated with Δβ values for religiosity.

Consistent with a positivist ontology, this study treated social television adoption as an observable phenomenon amenable to empirical measurement (Bryman, 2016). The measurement model displayed satisfactory psychometric properties: all constructs achieved convergent validity (AVE > 0.50) and discriminant validity according to the Fornell-Larcker criterion, confirming that each scale captured a distinct aspect of the proposed framework.

Moving to the structural model, key antecedents of behavioural intention emerged with statistical significance: performance expectancy ($\beta = 0.31$, $p < .001$), facilitating conditions ($\beta = 0.27$, $p < .001$), habit ($\beta = 0.23$, $p < .001$), hedonic motivation ($\beta = 0.21$, $p < .01$) and price value ($\beta = 0.18$, $p < .05$). Notably, technology awareness, which is a measure of users' familiarity with interactive features, was also a robust predictor ($\beta = 0.29$, $p < .001$). Together, these variables

accounted for 62 % of the variance in behavioural intention ($R^2 = 0.62$), underscoring the explanatory power of the extended UTAUT2 model in a context previously unexamined quantitatively (Khoshrouzadeh, 2020; Venkatesh et al., 2012).

The moderation analysis further demonstrated that religiosity altered adoption pathways: high religious commitment weakened the effect of social influence on intention ($\Delta\beta = -0.12$, $p < .05$) while enhancing the influence of hedonic motivation ($\Delta\beta = +0.10$, $p < .05$). These findings substantiate that, in a region where religious practice is integral to daily life, moral norms can both constrain peer‑driven pressures and heighten the role of enjoyment in technology usage (Abubakar, Ahmad, 2020; Abdulkadir et al., 2021).

Additional multi‑group comparisons revealed demographic stratifications consistent with a realist ontology: male students exhibited stronger paths from hedonic motivation to intention ($\Delta\beta = +0.12$, $p < .05$) and from habit to both intention and actual use ($\Delta\beta = +0.12$, $p < .05$), whereas female students were more responsive to performance expectancy ($\Delta\beta = -0.12$, $p < .05$). Older students placed greater weight on habit and facilitating conditions ($\Delta\beta = +0.12$, $p < .05$), while younger cohorts responded more to social influence ($\Delta\beta = -0.12$, $p < .05$). Likewise, experienced multiscreen users valued effort expectancy and facilitating conditions more highly than novices, who remained guided chiefly by performance expectancy.

These quantitative patterns affirm that social TV adoption in Northern Nigeria is not homogeneous but stratified across religiosity and demographic groups. From a positivist epistemology, the precise quantification of coefficients and change-in-beta values provides replicable, generalisable knowledge, establishing a foundational dataset for subsequent investigations (Godler et al., 2020; Guenther, Kessler, 2017; Habgood-Coote, 2025; Rogers, 2003). Given the novelty of social TV research in this milieu, such an approach was indispensable to deliver objective benchmarks that support evidence‑based policy and inform media practitioners' decision-making.

5. Conclusion

This study has delivered the first empirically grounded account of social television adoption among university students in Northern Nigeria. Adopting a realist ontology, we treated adoption behaviours, such as frequency of second-screen use, commenting and sharing, as objective phenomena amenable to precise measurement (Bryman, 2016). Under a positivist epistemology, knowledge was generated via structured surveys and inferential statistics, ensuring replicable and generalisable findings (Saunders et al., 2019). Our extended UTAUT2 model, augmented with technology awareness (which also encompasses digital-literacy competencies) and religiosity, explained 62 % of variance in behavioural intention. Performance expectancy, facilitating conditions and habit emerged as primary drivers, while technology awareness proved a critical antecedent ($\beta = 0.29$, $p < .001$). Moderation analyses demonstrated that higher religious commitment diminishes peer influence ($\Delta\beta = -0.12$, $p < .05$) yet enhances the role of permissible enjoyment ($\Delta\beta = +0.10$, $p < .05$). Age, gender and prior experience further partitioned these effects into measurable group – specific patterns.

Implications for Islamic Instruction and Proselytisation: Social TV 'convergence frameworks' provide novel channels for faith instruction: live Qur'ānic recitations can be synchronised with in-app fact-checked subtitles (Ahmad, Khalid, 2024; Golan, Martini, 2019), group prayers can be conducted via moderated chat, and scholarly lectures streamed with annotation features that allow viewers to query doctrinal points in real time (Smith, Adeoye, 2023). For proselytisation, developers might incorporate ethically moderated discussion forums where participants can request guidance, subject to religious-scholar moderation. Such features, aligned with the digital-literacy recommendations in the literature (Gibson, Capdeville, 2019; La'aro, 2016; Muringa et al., 2024), help users to verify the authenticity of religious content and to distinguish between doctrinal teaching and promotional material.

Commercial and Marketing Applications: From a commercial standpoint, social marketers and advertisers may embed sharia-compliant product showcases within programming, accompanied by clear provenance metadata that educated consumers can verify, which is a practice shown to increase trust in faith-sensitive markets (Andespa et al., 2024; Kismawadi, Syahril, 2025; Ribadu, Rahman, 2019). E-commerce integrations permit immediate purchase of endorsed goods, stimulating brisk online sales while preserving ethical standards. Entertainment-enhancement features, such as polls on religious-themed dramas or faith-based quiz segments, capitalise on

hedonic motivation but remain within doctrinal boundaries. Digital-literacy research warns that unlabelled sponsored content can mislead audiences (Noble, Gachago, 2022; Steils et al., 2022); accordingly, clear labelling and user education modules must accompany every shoppable element (Ogbodo et al., 2023).

Guidelines for Stakeholders: For app developers and content creators, this study provides statistically substantiated pathways for user-centred design that respects both technological efficacy and cultural consonance. Specifically:

1. *Embed Digital-Literacy Tutorials*: Integrate in-app guides and short assessments, drawing on recommended best practices in the literature (e.g., Sahlan, Wahyuni, 2025), that train users to evaluate source credibility, recognise sponsored posts and understand algorithmic grouping.

2. *Faith-Compatible Interfaces*: Offer optional modules for live religious content, with built-in prompts to query speaker credentials, as demonstrated effective in Ahmad and Khalid, and Golan and Martini's (Ahmad, Khalid, 2024; Golan, Martini, 2019) study of televised religious programming.

3. *Demographic Segmentation*: Employ algorithmic segmentation to customise messaging, for example, highlight "efficient viewing" features for female audiences and "engaging entertainment" for male users, while using peer-network endorsements for younger cohorts, consonant with Philip and Zakkariya (Zakkariya, 2019).

Policy and Regulatory Recommendations: Quantitative evidence of demographic and religious moderation can inform regulatory guidelines from the Nigerian Broadcasting Commission (NBC) and the National Communications Commission (NCC). We recommend:

– *Transparency Mandates*: Require platforms to disclose content-moderation policies and sponsored-content labelling, in line with the literature (e.g., Gibson, Capdeville, 2019; La'aro, 2016; Muringa et al., 2024) call for digital media-literacy-oriented regulation.

– *Media-Literacy Quotas*: Incentivise broadcasters to dedicate a minimum percentage of airtime to media-literacy segments that teach critical viewing skills for social TV environments (Andespa et al., 2024; Kismawadi, Syahril, 2025; Ribadu, Rahman, 2019).

Reflection on Positivist Foundations: A strictly quantitative design was indispensable in establishing the first empirical benchmarks for social TV adoption in a nascent research context (Rogers, 2003; Saunders et al., 2019). While constructivist approaches can underpin subjective experience, they cannot deliver the clear, replicable metrics necessary for policy-relevant guidance. This study's measurement of discrete group differences and hypothesis testing adheres to the positivist ideal of theory confirmation through statistical validation, thereby securing a reliable foundation for subsequent qualitative work (Bhattacherjee, 2001).

Limitations and Future Research Directions: Despite its robust sample, the cross-sectional design limits causal inference, and non-student populations remain unexplored. Future studies should employ longitudinal surveys to track adoption trajectories and incorporate mixed methods, such as structured interviews and focus groups, to unpack the meanings behind the quantitative patterns. Further research might examine the efficacy of specific media-literacy interventions, such as workshops and tutorial gamification, using experimental designs to assess impact on adoption intent (Noordin, 2024).

This study's quantifying how technology awareness, enriched with media-literacy competencies, and religiosity influence social TV use, this study equips developers, educators and regulators with concrete, data-driven strategies for culturally sensitive implementations. In contexts where infrastructure and tradition intersect, the future of social television rests on locally informed innovation, underpinned by empirical evidence that can guide design, policy and pedagogy in faith-centred digital ecosystems.

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Artificial Intelligence and Information Literacy in Turkey: A Content and Bibliometric Analysis from 2005 to 2025

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Abstract

Information and artificial intelligence literacy has emerged as a fundamental skill essential for individuals across all age levels in society. The purpose of this study is to promote awareness of information literacy and artificial intelligence literacy, as well as to examine how artificial and information literacy has changed over the last two decades. For this reason, the Turkish Council of Higher Education National Thesis Centre was searched for information literacy and artificial intelligence literacy concepts. This study employed bibliometric and content analytic methodologies to investigate developments in information literacy and artificial intelligence within higher education research from 2005 to 2025. Analysis is done on the 20-year evolution of artificial intelligence and information literacy. Research indicates that the demand for and interest in data, information, and artificial intelligence literacy have grown dramatically over time. The research's findings from the bibliometric and content analysis give an overview of the literature on information, data, and artificial intelligence literacy, highlighting the most pertinent theses, departments, research methodologies, and popular keywords. This paper advocates for a holistic methodology for investigating literacy, information, artificial intelligence, and data literacy. This study articulates essential support and a guiding framework for research on information, data, and artificial intelligence literacy.

Keywords: information literacy, artificial intelligence, artificial intelligence literacy, communication studies, new communication technologies, Türkiye.

1. Introduction

Information literacy is requisite for continuous learning in the contemporary digital environment. It is applicable to all academic fields, disciplines, learning environments, and educational levels (Pinto et al., 2019). Information literacy has evolved as a vital skill necessary for persons across all age levels in society. The idea of digital information literacy has gained prominence along with the advancement of communication technology and the sharp rise in the quantity of digital communication instruments. Information literacy is the main dimension of artificial intelligence literacy. The idea of information literacy (IL) has generated a great deal of debate about its meaning and consequences for students and librarians in a constantly evolving information environment since it first entered the professional conversation in the 1970s (Tewell, 2015: 25). Bothma and Fourie (Bothma and Fourie, 2025), clarified that requests for information literacy to be addressed at all societal levels and settings have been made for many years. Paul Zurkowski coined the term "information literacy" in his 1974 report to the National Commission on Libraries and Information Science (Chen et al., 2021: 48). Paul Zurkowski (Zurkowski, 1974), emphasize that information is not knowledge; rather, it is thoughts or ideas that enter a person's

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field of perception, are assessed, and are internalized, so altering that person's perception of reality and their capacity for action. Zurkowski has revealed information literacy is the ability or perception of people. According to the 1989 Final Report of the American Library Association Presidential Committee on Information Literacy, which defined IL as follows, information literacy necessitates the ability to identify when information is needed and to effectively use, set out, and evaluate the necessary information (Chen et al., 2021: 48).

Information literacy is a crucial dimension of societal development and transformation. It helps people find, comprehend, and employ information in a world that is always changing (Hanif and Hassan, 2025: 1). Information literacy is the skills to use, manage, evaluate, and communicate information of individuals. Both the skill to conduct effective information searches and the capacity to assess information using suitable standards are components of information literacy (Chura-Quispe et al., 2025: 4). Information literacy encompass understanding the need for information in order to locate, assess, and effectively utilize it (Perez et al., 2025: 8). Information literacy classified into four different dimensions as information search, information management, information evaluation and information communication (Chura-Quispe et al., 2025: 4). IL assists students, educators, medical professionals, engineers, attorneys, jurists, lawmakers, researchers, administrative personnel, schoolchildren, entrepreneurs, industrial laborers, and individuals in achieving excellence in their respective domains (Kolle, 2017: 283).

1. Information search: An essential component of information literacy pertains to the methods individuals employ to search for, access, and pick the most pertinent information (Chura-Quispe et al., 2025: 4).

2. Information management: Understanding and using technologies like software, academic text processing systems, spreadsheets, databases, and information storage are all part of information management (Chura-Quispe et al., 2025: 4).

3. Information evaluation: Information literacy means for the ability to assess information, including digital communication. The process of information analysis requires the verification of its authenticity and originality (Adams, 2025: 123).

4. Information communication: Information communication defines appropriate involvement in virtual environments, using Internet tools to communicate and spread knowledge while participating in networks or groups related to academics and extracurricular activities (Chura-Quispe et al., 2025: 4).

Artificial intelligence literacy is one of the ideas that has emerged with the advancement of artificial intelligence. The term "AI literacy" was first established by Burgsteiner et al. (Burgsteiner et al., 2016), , who outline the competencies required to understand essential knowledge and concepts related to AI (Su et al., 2023: 2). According to Burgsteiner et al. (Burgsteiner et al., 2016), literacy in AI/computer science will become a significant problem in the future, much like traditional literacy, which covers writing, reading, and math. Additionally, they stress that students who possess AI literacy are also well-prepared for their future careers and further university coursework. The importance of artificial intelligence (AI) literacy is growing in a world where algorithms frequently determine what we see, hear, and learn. Children utilize AI recommendations to choose what to watch, ask Siri or Alexa for help with their arithmetic assignments, and use online path planning algorithms to find their way to friends' homes (Van Brummelen et al., 2021: 15655). AI literacy encompasses elucidating the operational mechanisms of AI technologies, their societal impact, employing them ethically and responsibly, and effectively collaborating and communicating in many contexts. It focuses on knowledge and abilities (Chiu et al., 2024: 4). Long and Magerko (Long, Magerko, 2020) define AI literacy is a set of abilities that enable people to evaluate AI technology judicially interact and work with AI effectively and use AI as a tool in home, professional and online contexts. AI literacy comprises a set of guidelines for developing educational interventions that enhance users' understanding of generative AI, enabling them to engage effectively, responsibly, and critically (Zhang, Magerko, 2025: 3).

2. Materials and methods

This study aims to explain and examine how we can use and develop information literacy and artificial intelligence literacy concepts and skills in Türkiye by investigating graduate theses. In accordance with this main purpose, this study looks into the following research questions:

Research Question 1: Which literacy concepts were subjected to the research?

Research Question 2: What are the used keywords in graduate theses?

Research Question 3: What is the distribution of graduate theses according to years?

Research Question 4: What are the type of thesis in graduate theses?

Research Question 5: What are applied research methods in graduate theses?

Research Question 6: What is the distribution of graduate theses according to universities?

Research Question 7: How are graduate theses distributed in terms of public or foundation university rates?

Research Question 8: What is the distribution of graduate theses according to the department?

This study is carried out on information and artificial intelligence literacy graduate theses and dissertations in the Turkish Council of Higher Education National Thesis Center between January 1, 2005, and June 1, 2025, in Türkiye. In this study, the patterns of graduate theses, types of theses, used methods, areas of research, types of respondents, university preferences, and sampling are presented. It is applied as a content analysis method by analyzing graduate theses. A detailed and developed search at the Turkish Council of Higher Education National Thesis Center is conducted for the digital literacy keyword (Turkish Council of Higher Education National Thesis Center, 2025). This study has two stages: information literacy and artificial intelligence literature review and an analysis of information literacy-based graduate theses in the Turkish Council of Higher Education National Thesis Center. This study is limited to the topic of information and artificial intelligence literacy and examines graduate information and artificial intelligence literacy theses and dissertations.

Using keywords associated with "information literacy, artificial intelligence literacy, digital information literacy, data literacy, and social media information literacy," this study gathered data from the Turkish Council of Higher Education National Thesis Center database between January 1, 2005, and June 1, 2025. This produced a total of 96 theses. After an exhaustive analysis between 2005-2025 year, 96 theses were selected to work with, based on the following inclusion and exclusion criteria:

The following are the criteria for inclusion:

– English and Turkish language;

– Only information, digital information, data, media and information, social media information and artificial intelligence literacy theses;

– Allowed theses;

– Studies published from 2005 to 2025 (June).

Concerning the criteria for exclusion:

– Other literacy theses were not considered.

This study employed bibliometric and content analytic methodologies to investigate developments in information literacy and artificial intelligence within higher education research from 2005 to 2025.Content analysis define as a research method drawing reproducible and accurate conclusions and implications from texts to their contexts of use (Krippendorff, 2018). Bibliometric analysis is a systematic examination of scientific literature aimed at identifying patterns, trends, and impact within a specific topic. Bibliometric methodology employs quantitative techniques, including author analysis, citation analysis, and keyword analysis, to examine bibliometric data (Passas, 2024). Ali et al. (Ali et al., 2023) contend that the bibliometric study facilitated researchers in acquiring deeper insights into the chosen issue and aided in identifying the factors employed in research support services within academic libraries.

3. Discussion

The consequences, significance, and outcomes of information literacy, as well as its use and the relationship between information literacy and artificial intelligence literacy, are assessed in this section based on a review of the research and its applicability to various cultures, institutions, individuals, and age groups. In order to stay relevant in the digital age and life-long learning in society, information literacy is critical value. Asif and Naveed (Asif, Naveed, 2025) explained the importance of information literacy in terms of life-long learning and creativity in the digital information society. According to the study's findings, creativity and lifelong learning are positively impacted by information literacy. In that vein, it is thought that information literacy and especially recently artificial intelligence literacy are crucial for digital citizenship and digital attendance. Trixa and Kaspar (Trixa, Kaspar, 2024) articulated that the transition switching from conventional media to online resources to find information was one noteworthy discovery.

Ng et al. (Ng et al., 2021) assert that artificial intelligence is evolving into an essential competency for all individuals, not solely for computer scientists. We should incorporate artificial intelligence (AI) into all students' twenty-first-century technology literacy in the workplace and in daily life, in addition to reading, writing, math, and digital skills. Bloom's taxonomy states that AI literacy encompasses core competencies for understanding, applying, evaluating, and creating AI. A complementary domain known as productive AI literacy arises along with AI literacy. Zhang and Magerko (Zhang, Magerko, 2025) argue that the current literature on "generative AI literacy" is sparse but expanding. Examples of generative AI literacy include four dimensions: knowledge, application, evaluation, and ethics. Pinto and Segura (Pinto, Segura, 2025) discuss mobile information literacy and divide it into three categories: connectivity, mobile devices, and mobile technology. In contrast to traditional media, social media necessitates new information management abilities, such as accessing and locating pertinent material as well as creating customized social media newsfeeds, according to Heiss et al. (Heiss et al., 2023). Thus, they claim that social media information literacy is necessary.

According to Guerola-Navarro's (Guerola-Navarro, 2023) study, the data generally indicate that there is more interest in information literacy than media literacy as a factor for citizen participation. Kavut (Kavut, 2024) asserts that in the contemporary digital world, digital literacy is an essential ability for all, and the significance of this issue is escalating in Türkiye. Merga and Roni (Mega, Roni, 2025) assert that the increasing volume of digital information in online environments necessitates a redefinition of information literacy, characterizing an information literate student as one who acknowledges the importance of information and can efficiently and ethically seek, access, process, and utilize it. Stieglitz et al. (Stieglitz, 2024: 15) assert that swiftly advancing AI technologies are revolutionizing the communication habits of societies, companies, and people. They highlight that AI literacy is a crucial pillar for managing these changes, for those speaking on behalf of companies as well as their stakeholders. Shiri (Shiri, 2024) suggested a taxonomy of AI literacy following a comprehensive evaluation of AI taxonomies, literature on AI literacy, previous research on data, information, and digital literacy, and an examination of metadata records from AI literacy publications.

Whitfield and Yang (Whitfield, Yang, 2025) examine four GENAI chatbots: the two types of ChatGPT, Microsoft Copilot, and Google Gemini. They declared that, based on research from Rider University, Google's Gemini is the most effective GENAI chatbot. Chaudhuri and Terrones (Chaudhuri, Terrones, 2025) state that as California State University students' use of AI tools advances, the current information literacy program will need to be substantially redesigned. They point out that when it comes to established norms and regulations governing students' usage of this new technology, artificial intelligence in higher education has not yet found equilibrium. Using the Web of Science, IEEE Xplore, SCOPUS and ERIC databases, Biagini (Biagini, 2025) investigates AI literacy and the revolutionary effects of AI in various sectors. The study emphasizes the necessity of interdisciplinary cooperation in the creation of AI literacy initiatives. To learn how to encourage AI competency and literacy in K–12 education, Zhou et al. (Zhou et al., 2025) examines 47 publications from Scopus, ProQuest, and Web of Science. The analysis made clear that self-reflection and emotional components should be included in the current concept of AI literacy. Media and information literacy require the ability to judicially evaluate information, as Haider and Sundin (Haider, Sundin, 2022) point out. Agency and trust are two elements that are emphasized in the analysis.

Lao et al. (Lao et al.,2025) investigate how young people interact with deepfakes and provide data on media information literacy practices from two angles: how young people understand "deepfake" and how they interact with deepfake content in their daily lives. Peciuliauskiene (Peciuliauskiene, 2025) investigates the relationship between novice instructors' digital self-efficacy in information literacy education and several facets of information literacy. They found that information assessment and processing skills are major factors that influence digital self-efficacy in information literacy instruction. Zhan and Yan (Zhan, Yan, 2025) examine implications of ChatGPT feedback and student feedback literacy. The findings reveal that GENAI is regarded as a panacea for student feedback literacy. Feedback is considered a crucial component in higher education teaching and learning. Akakpo (Akakpo, 2024) articulates that information literacy teaching must encompass digital topics within university libraries. Thus, information literacy and digital, data, and artificial intelligence literacy are related each other. Before students start writing their dissertations, they should receive information literacy instruction at the beginning of their

university studies. Guidelines for students' use of generative AI tools should be suggested by university libraries. Uribe-Tirado and Machin-Mastromatteo (Akak Uribe-Tirado, Machin-Mastromatteo, 2024) assert that the examination of the Latin America's information literacy history, present, and future culminates in the conclusion that, despite its extensive history both regionally and globally, this conceptualization and practice is increasingly significant, necessitating appropriate updates and integration with other forms of literacy.

4. Results

This part delineates the findings of the content and bibliometric analysis, encompassing the total publication count, temporal distribution, keyword allocation, departmental affiliations, university classifications, research methodologies, subject domains, and graduate theses pertaining to artificial intelligence, data, and information literacy.

Table 1. Distribution of graduate theses according to technology based literacy concepts

Concepts	N	%
Information literacy	84	88
Digital information literacy	0	0
Social media information literacy	0	0
Media and information literacy	0	0
Artificial intelligence literacy	7	7
Data literacy	5	5
Total	96	100

Table 1 shows that a total of 96 graduate theses on technology-based-literacy associated concepts were examined, in Turkish Council of Higher Education National Thesis Center databases. It was found that information literacy made up 88 % of the research, followed by artificial intelligence literacy (7 %) and data literacy (5 %). None of the research terms "digital information literacy," "social media information literacy," or "media and information literacy" were found. In other words, Table 1 indicates that the majority of research focuses on information literacy (88 %), whereas artificial intelligence literacy constitutes 7 %. Additionally, just 5 % of the studies was determined to be about data literacy.

Table 2. Distribution of graduate theses according to years

Thesis Year	N	%
2025	3	3
2024	7	7
2023	7	7
2022	16	17
2021	7	7
2020	6	6
2019	20	21
2018	5	5
2017	6	6
2016	3	3
2015	4	4
2014	2	2
2013	3	3
2012	2	2
2011	2	2
2010	0	0
2009	0	0
2008	2	2
2007	1	6
2006	0	0
2005	0	0
Total	96	100

Postgraduate theses from 2005 to 2025 were scanned using the information literacy, data literacy, artificial intelligence literacy, social media information literacy, and digital information literacy concepts however, no thesis from 2010 or earlier was found excluding few studies in 2007 and 2008 years. We concluded that 2019 saw the majority of these writings.
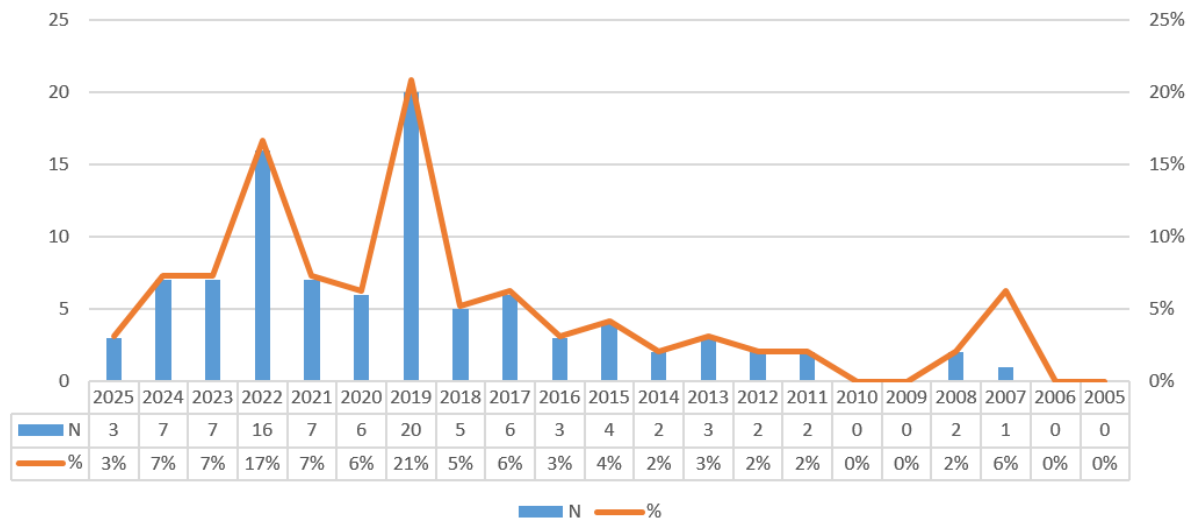
Fig. 1. Distribution of data, information, and AI literacy studies across a 20-year period

Figure 1 illustrates how the notion of literacy gained prominence in Türkiye's higher education after 2011 and spread widely after 2019. Information literacy studies were noticed in 2011, while data and artificial intelligence literacy issues gained prominence in 2023 and the years that followed. Prior to 2010, there were no studies on information, data, or artificial intelligence literacy excluding few studies in 2007 and 2008 years.

Table 3. Distribution of graduate theses according to keywords

Keywords	N	%
Information	7	4
Information literacy	61	35
Science literacy	2	1
Data literacy	2	1
Evaluation literacy	1	1
Information literacy	2	1
Geography literacy	1	1
Artificial intelligence literacy	6	3
Technology literacy	6	3
Digital literacy	4	2
Computer literacy	2	1
Science literacy	6	3
Financial literacy	1	1
Critical literacy	1	1
Media literacy	10	6
Environmental literacy	1	1
Health literacy	2	1
Awareness	3	2
Education	5	3
Information utilization	1	1
Information literacy education	28	16
Critical thinking	3	2
Technology adaptation	1	1
Self-learning	1	1
Life-long learning	4	2
Disinformation	1	1
Skill training	1	1
Technology utilization	6	3

Keywords	N	%
Artificial intelligence	5	3
Virtual literacy	1	1
Life skills	1	1
Total	176	100

Based on the keyword analysis of the graduate theses, the frequently used terms fall into three categories: information literacy, information literacy education, and media literacy. Various forms of literacy, including scientific, geographic, environmental, critical, financial and health literacy, were also examined as a result of the investigation.

Table 4. Distribution of theses according to types

Type of Thesis	N	%
Master's Degree	76	79
PhD	20	21
Total	96	100

When the theses were classified according to their type, 76 master's and 20 doctorate theses were found. In particular, the number of technology-based theses, such as data literacy and artificial intelligence literacy, has increased in the last few years, indicating that the majority of theses are master's theses.

Table 5. Distribution of theses according to department

Department	N	%
Computer and Instructional Technologies	13	14
Education Technology	1	1
Information and Document Management	19	20
Lifelong Learning	1	1
Turkish and Social Sciences Education	4	4
International Relations	1	1
Education Programmes and Teaching	2	2
Mathematics and Science Education	6	6
Education Management and Supervision	2	2
Physical Education and Sports Education	3	3
English Language Education	3	3
Fine Arts Education	1	1
Psychology	1	1
Virtual Communication Design	1	1
Education Science	9	9
Philosophy and Religious Sciences	1	1
International Relations and Political Science	1	1
Education Management	1	1
Strategy Science	2	2
Public Health	1	1
Radio Television and Cinema	2	2
Internet and Information Technologies Management	1	1
Primary education	6	6
Business	1	1
Social Studies and Turkish Education	2	2
Interior Architecture	1	1
Distance Education	1	1
Public Relations and Publicity	2	2
Nursing	2	2
Sociology	1	1
Business Management	1	1
Management Information Systems	1	1
Preschool Education	1	1
Finance	1	1
Total	96	100

Upon departmental analysis of the theses, it was shown that the departments with the highest volume of theses were Information and Document Management, Computer and Instructional Technologies, and Education Sciences.

Table 6. Distribution of theses according to universities

University	Master's Degree N	%	PhD N	%
Abant İzzet Baysal	1	1	1	5
Adnan Menderes			1	5
Afyon Kocatepe	2	3		
Anadolu	1	1	1	1
Ankara	1	1		
Ankara Yıldırım Beyazıt	1	50		
Atatürk	3	4		
Bahçeşehir	2	3	1	5
Bartın	1	1		
Başkent	2	3		
Beykent	1	1		
Binali Yıldırım	1	1		
Çankırı Karatekin	8	11		
Dokuz Eylül	1	1		
Ege	1	1		
Eskişehir Osmangazi	1	1		
Fırat	3	4	1	5
Galatasaray	1	1		
Gazi	3	4	6	30
Gebze Teknik	2	3		
Hacettepe	5	7	5	25
Harran	1	1		
Hasan Kalyoncu	1	1	1	5
Iğdır	1	1		
İnönü	1	1		
İstanbul			1	5
İstanbul Bilim	1	1		
İstanbul Medeniyet	1	1		
Kafkas	1	1		
Karadeniz Teknik	1	1		
Kastamonu	1	1	1	5
Kırıkkale	1	1		
Koç	1	1		
Maltepe	1	1		
Marmara	8	11	1	5
Muğla Sıtkı Koçman	1	1		
Muş Alparaslan	1	1		
Necmettin Erbakan	4	5		
Niğde Ömer Halisdemir	2	3		
Recep Tayyip Erdoğan	1	1		
Sakarya	1	1		
Selçuk	1	1		
Siirt	1	1		
Süleyman Demirel	1	1		
Uludağ	1	1		
Zonguldak Bülent Ecevit	1	1		
Total	76	100	20	100

Table 6 displays the distribution of master's theses and PhD dissertations throughout Turkish universities. The table indicates that Marmara and Çankırı Karatekin University possesses the most master's theses in information, data, and artificial intelligence literacy, whereas Gazi University has the most doctorate theses. The universities with the highest number of theses produced were Çankırı Karatekin, Gazi, Hacettepe, and Marmara universities.

Table 7. Distribution of theses according to research methods

Research method	N	%
Qualitative	16	17
Quantitative	58	60
Mixed	22	23
Total	96	100

The distribution of the examined theses according to research methodologies is displayed in Table 7. Experimentation and bibliometric analysis are also included; however, 60 % of the studies are quantitative in nature. Twenty-three percent of the studies use mixed methodologies, and 17 percent use qualitative research. The quantity of mixed-method theses, integrating qualitative and quantitative research methodologies, has been consistently increasing.

Table 8. Distribution of theses according to type of university

Type of University	N	%
Public University	85	89
Foundation University	11	11
Total	96	100

The data depicted in Table 8 reveals the distribution of postgraduate theses on information, data, and artificial intelligence literacy in Türkiye by foundation and public university distribution. Eighty-nine percent of the studies are from public universities, and eleven percent are from foundation universities.

5. Conclusion

This study encapsulates the subjects, themes, keywords, and methodologies, along with the dissemination and evolution of issues over time in Turkey regarding information literacy, artificial intelligence literacy, data literacy, and other literacy studies. This study employed bibliometric and content analytic methodologies to investigate developments in information literacy and artificial intelligence within higher education research from 2005 to 2025. Analysis is done on the 20-year evolution of artificial intelligence, and information literacy. Research indicates that the demand for and interest in data, information, and artificial intelligence literacy have grown dramatically over time. Although there were none from 2005 to 2010 excluding few studies in 2007 and 2008 years, it was noted that after 2011, the number of studies progressively rose. Seven pieces of research on artificial intelligence literacy were found to be from 2023–2025. Three methodologies were identified in the selected graduate theses from this systematic evaluation of artificial intelligence and information literacy in higher education: 58 used a quantitative technique, 16 used a qualitative approach, and 22 were combined. Because both contribute to studies on people's digital competences, it is advised that future research on artificial intelligence, data, and information literacy employ both a quantitative and a qualitative approach.

It is examined in national and international literature. According to current studies, information literacy's importance and need for information literacy, data literacy and artificial intelligence literacy have gained momentum. In the twenty-first century, being information literate is essential. The significance of information literacy has long been recognized by the renowned management expert Peter Drucker. "You have to take responsibility for information because it is your primary tool in today's organization," he said (Karisiddappa et al., 2020: 109). Thorpe's (Thorpe, 2025) study aimed to assess Australian information literacy research and practice from 1974 to 2024. According to the data from this study, information literacy has never been a static notion; rather, it has changed and is still used in a variety of contexts and circumstances. Fernández-Otoya et al. (Fernandez-Otoya et al.,2024) assert that a direct correlation exists between digital competency and information literacy. They also underlined that information and digital literacy are ongoing and long-run processes. According to Madunic and Sovulj (Madunic, Sovulj, 2024), the findings of two potential applications of ChatGPT in higher education information literacy instruction are presented. First, a technique for creating written instructional materials with ChatGPT's help has been described, showing how the model can be applied

successfully. Second, a small-scale custom AI chatbot has been developed and tested to serve as an extra teaching tool.

The research's findings from the bibliometric and content analysis give an overview of the literature on information, data, and artificial intelligence literacy, highlighting the most pertinent theses, departments, research methodologies, and popular keywords. Future research should look into how information literacy and artificial intelligence literacy principles have been applied in fields of study other than higher education, such as high school, primary, and pre-school. This study articulates essential support and a guiding framework for research on information, data, and artificial intelligence literacy. It can also help researchers who want to study information literacy, data literacy, lifelong learning, and artificial intelligence technology for future research. This study is valuable for evaluating and indicating higher education trends in information literacy, data literacy, and artificial intelligence literacy.

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Artificial Intelligence in Students' Learning Activities

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Abstract

The introduction and strengthening of the role of artificial intelligence (AI) in society determines the need to modernize the educational policy of modern universities. The purpose of the article is to study the practices of using AI in the educational activities of students, their attitudes and requests for neural networks, to assess the possible risks and consequences of these processes for the formation of students' media competencies. In the course of work on the article, sociological research methods were used (an online questionnaire survey of students). The sample includes 691 respondents, mainly studying in bachelor's degree programs. Modern students use neural networks to search for the necessary information (76.1 %), increase the originality of the text (30.5 %), write term papers, essays and theses (27.8 %). The hypothesis was confirmed that the increase in requests to "digital intermediaries" (chatbots based on neural networks) during students' educational activities is associated with the spread of practices of using AI in their everyday lives. Despite the high level of loyalty to neural networks, young people are very wary of the practices of expanding their functionality in terms of knowledge control and building individual learning algorithms. Empirical data illustrate the presence of interpretative biases in assessing the potential of AI, the prevalence of consumer demands of students. The risks of the spread of AI in educational activities are highlighted: a decrease in students' media competencies in terms of analyzing educational material, its reflection, erosion of traditional educational values, an increase in academic fraud, a reduction in the potential of AI in terms of building individual educational trajectories, monitoring and assessing knowledge. The article offers recommendations for improving the pedagogical practice of teaching media literacy to prevent destructive risks of introducing artificial intelligence into the educational process.

Keywords: artificial intelligence, neural networks, higher education, educational activities, educational values, media competence, media skills, text analysis, knowledge assessment, risks.

1. Introduction

The introduction of digital technologies into the educational process significantly changes the educational landscape, transforming the communicative practices of interaction between teachers and students, the specifics of the formation of their medical competence in the educational space of higher education. Digital technologies are one of the key factors in increasing the effectiveness of training, expanding the boundaries of its adaptability, focusing on the individual needs of students

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(Yakovleva, 2025). The phenomenon of artificial intelligence (AI) as an attribute of modern digital reality is becoming the object of close attention of higher education entities. According to experts, the ability of AI to become a new driver of economic development (Ibragimova et al., 2023) requires the training of specialists capable of using it effectively (Kohli, 2024), which in turn will affect the labor market (Fayzullin et al., 2025). The widespread use of AI technology is associated with the emergence of generative artificial intelligence (GigaChat, YandexGPT, ChatGPT, Claude, etc.), which allows users, even without training, to process large volumes of text information, create presentations, compose music, etc. At the same time, the scaling of information and the expansion of its processing capabilities by AI tools impose higher demands on teaching students media literacy. The development of neural networks actualizes the issue of the reliability of information, its critical perception and evaluation. In these conditions, the creation of an educational environment in higher educational institutions for the development of students' media literacy is one of the key factors in the social security of society.

According to experts, AI makes significant changes in the forms of media consumption of young students, focusing the latter's attention on the potential of generative intelligence in searching and processing data. Simplification of interpretative procedures for working with media content, both during classes and in students' everyday practices, determines the specifics of the formation of young people's media competencies, the possible vector of their development in modern conditions.

Approximation of AI capabilities, due to technological or cognitive barriers of the educational environment, is also intended to align the educational process of higher education with the differentiated interests of students and the updated needs of the labor market. This thesis is actively supported by the current state policy: within the framework of the "National Strategy for the Development of Artificial Intelligence for the Period up to 2030", the use of AI is positioned as a significant component of the information space for the reproduction of scientific and applied knowledge. Being a set of "technological solutions that allow simulating human cognitive functions", AI acts in two roles: 1) a digital intermediary between a student and information; 2) a digital tool/technology for finding solutions, obtaining results of intellectual activity "comparable to human" (Avramenko et al., 2024). This provision became the starting point and served as a methodological vector for this study.

2. Materials and methods

The purpose of the work is to study the practices of using artificial intelligence in the educational activities of students, to determine the target settings of respondents in the process of using neural networks, to analyze the possible risks and social consequences of these processes, including in the context of the formation of media competence of young people. The following research tasks were set in the work:

– To analyze the orientations and needs of students that determine their use of AI in the learning process.

– To determine the students' readiness to expand the functionality of AI in education (definition of learning algorithms, knowledge control).

– To determine the key risks of using AI in the educational activities of students.

– To study the role of teaching students media literacy and its potential to overcome the destructive effects of using AI in education.

An online questionnaire survey of student youth was defined as the basic research method. The choice of this method is due to the need for a wide coverage of the opinions of the object of study, as well as territorial remoteness. The total sample was N = 691, which corresponds to the objectives of the pilot type of research. The sample is dominated by students studying in bachelor's programs (75.3 %). The spontaneous nature of the sample formation can be considered as a limitation of this study.

Research hypotheses:

1. The spread of AI practices in the everyday life of modern youth causes an increase in requests for "digital intermediaries" (chatbots based on neural networks) during educational activities.

2. Destructive practices of using AI in the educational activities of young people limit the potential of higher education in the formation of media competence of young people.

3. The potential for using AI in the practice of student educational activities is determined by a utilitarian approach, focusing on solving a narrow range of problems of their own academic performance (searching for material, rewriting, writing papers). At the same time, the prospects for expanding the boundaries of AI use in the processes of planning training and monitoring students' knowledge are perceived negatively.

3. Discussion

The conceptualization of ideas for using AI in education has its own history from establishing its adaptive functions to recognizing its ability to independently generate new knowledge. The first "ideologists" of this approach focused their attention on the adaptive capabilities of AI in intellectual support for speech recognition and synthesis, finding solutions according to a predetermined algorithm of actions (Notkin, 2009).

Quite quickly, the "digital crutch" acquired the features of an "intelligent companion" that is capable of cognitively adapting educational content to the capabilities and interests of each student at the student's request. On the part of the educational institution, recognition of this role of AI can be traced in the development of various variations of intelligent assistants – virtual student assistants integrated into educational platforms, chatbots and other services (Chertovskikh, 2019; Gálik, 2020; Gáliková Tolnaiová, Gálik, 2020).

The further vector of implementation and strengthening of the role of AI in education focused on its "generative" potential. An example is "chatGPT", the importance of which for the progressive development of the students' knowledge system has been widely recognized in foreign studies (Yuen, Schlote, 2024). In particular, the diffusion of information flows has actualized the ability of chatGPT to quickly process large amounts of data, create new information content based on knowledge obtained from outside (Kavitha, Joshith, 2024). At the same time, scientists draw attention to the role of teaching media literacy in the new conditions. Didactic approaches to developing students' media literacy involve developing young people's skills for critically assessing media content, stimulating behavioral patterns associated with "questioning and assessing the reliability and credibility of information sources" (Beikutova et al., 2024: 25).

The increased attention in the domestic agenda to end-to-end digital technologies has formed a demand not only for the labor market, but also for the higher education system to train specialists with the appropriate media skills and capable of using AI to process and analyze data. Thus, there is a transformation of the role of AI into a "digital intermediary", the use of which technologies should be learned.

The creation of digital interfaces in the educational space of higher education can be considered as the initial step towards creating controlled systems for monitoring students' cognitive involvement in the educational process. Of interest in this context are the arguments of S.P. Elshansky (Elshansky, 2021). According to the scientist, the potential of AI is not limited to the possibility of impersonal control of students' knowledge or the preparation of interactive tasks by a teacher designed to retain the interest of listeners (Rogach et al., 2024). The possible essence of AI may also lie not so much in the field of generating and accumulating knowledge, but, more significantly, in tracking the process of its loss. A shift in the educational perspective in the use of AI as a tool to counter the negative consequences of digitalization is becoming a predicate for the intensification of personalized learning. Its key features can be considered as follows: selection of an individual learning pace and format of educational content, taking into account the abilities and characteristics of the student's perception of the material, tracking the reduction of the student's academic knowledge, timely detection of possible cognitive deficits and losses of the material covered. Assessing the likelihood of a student forgetting the material is based not on his traditional reflection within the framework of a lesson with a teacher, but on the ability of AI to track the educational attention of students. In particular, more advanced technologies introduced into the educational process are able to "read" the level of student involvement in the assimilation of the material: the frequency of distractions by gadgets, communication with friends, the amount of time spent reading the material, the level of his functional literacy, as well as the stress experienced by students. In this context, the use of AI can provide the teacher with prompt information about the development or degradation of students' media skills.

It is worth noting that "digital optimism" in scientific discourse exists on par with critical perception of the expanding influence of AI in the modern education system. The long-term trend expressed in the use of AI can lead to cognitive atrophy, loss of basic media competencies,

which will lead to the inability of the student to independently search for and analyze large arrays of data. The replacement of functional literacy with digital literacy cannot be considered equivalent in this context.

The issue in foreign studies is also raised not in the methodological framework of combining digital and functional-cognitive skills of students, but rather in the focus of replacing the student's media competence with AI technologies. This replacement, according to N. Smith and D. Vickers, forms a broader field for discussion, raising the question of virtue and morality, the possibility of reproducing these values due to the lack of need for analysis and reflection of previous human experience (Smith, Vickers, 2024). Developing this point of view, S. Linderoth, M. Hultén and L. Stenliden talk about the need to take into account the social and technological consequences of the introduction of artificial intelligence in educational practice, assessing the long-term consequences and risks of these processes (Linderoth et al., 2024). Scientific studies emphasize the need to expand curricula aimed at developing the media competence of young people in the context of scaling AI technologies, their penetration into all spheres of public life (Luttrell et al., 2020).

Large-scale digitalization of all spheres of public life, the transfer of digital technologies from the sphere of innovations to routine practices, have led to the expansion of the boundaries of the use of neural networks in the educational activities of students. The study confirmed the hypothesis that the growth of appeals to "digital intermediaries" (chatbots based on neural networks) in the performance of educational tasks is determined by the spread of AI practices in the everyday life of modern youth.

Achieving academic performance goals in modern conditions is associated with qualified information search, its analysis and processing, preparation of high-quality content, which determines the formation of a request for "digital intermediaries" who are able to solve the tasks in a short time. However, simplifying the goals of using AI during training can lead to a number of destructive consequences for the medical competence of students. B.H. Nam and Q. Bai draw attention to the risks of academic fraud caused by the use of neural networks in the performance of educational tasks (Nam, Bai, 2023). Similarly, C.K. Filson and D. Atuase, confirming the relevance of the problem, talk about the growth of unfair practices in the use of AI in the educational environment, the need to revise the policies of universities, its focus on the ethical principles of academic honesty (Filson, Atuase, 2024).

According to A.Yu. Sogomonov, new trends in students using AI as a digital mediator when writing papers are destroying traditional university values of persistent intellectual work (Sogomonov, 2024). According to modern scientists, negative trends are largely due to information deficiencies among young people and insufficient awareness of students in the practice of determining the boundaries of illegal behavior (Nortes et al., 2024). N.V. Sushcheva draws attention to the need to implement educational activities in the field of AI, digital culture and media literacy (Sushcheva, 2024). New risks and the actualization of public demands for media literacy training for young people are related to the fact that the level of criticality in assessing and perceiving information generated by AI is decreasing. The deficit of media literacy among young people leads to the expansion of the boundaries of manipulation of public opinion.

Analysis of empirical data shows that modern students, despite their digital optimism regarding artificial intelligence, are nevertheless very cautious in recognizing the subjectivity of AI, and, consequently, expanding its functionality in the process of developing learning algorithms, monitoring and assessing knowledge. In contrast to students' judgments, scientists conclude that AI has significant potential in this area, which allows personalizing the learning process, building individual educational trajectories for each student, and ensuring higher student engagement (Keep, Brown, 2018; Kumar et al., 2024). As E.K. Belikova notes, it is the organization of the educational and methodological process that is the most significant area of using AI in higher education (Belikova, 2023). F. Filgueiras, supporting this conclusion, believes that AI is a driver of innovation, a factor in increasing the effectiveness of curricula and teaching methods (Filgueiras, 2023).

We can talk about the presence of interpretative biases in AI assessments, where the repertoire of using its technologies is compressed to the utilitarian roles of a "digital assistant" to whom the student delegates the performance of educational tasks. In this case, the consequences of using AI are concentrated in reducing students' media competence and simplifying their skills in working with information. Assigning functions of searching and primary processing of data to AI can be reflected in low critical thinking and irrelevant assessment of the reliability of the information source.

According to J.-C. Ruano-Borbalan, despite the technological optimism and excitement of AI fans, its potential in education has not yet been fully realized and there are no guarantees for the implementation of these positive scenarios in the near future (Ruano-Borbalan, 2025). As A.M. Al-Zahrani and T.M. Alasmari rightly note, the introduction of AI into the educational process should be consistent with the key target settings for the development of education as a whole, primarily improving its quality, developing students' competencies, and their creativity (Al-Zahrani, Alasmari, 2024).

However, it should be noted that, despite the existing risks, AI is becoming a new reality (about 85 % of surveyed students already use AI in the learning process), an attribute of everyday practices of young people, including educational, scientific and professional-labor. According to M.T. Marino, E. Vasquez, L. Dieker, J. Basham, J. Blackorby, AI is a revolutionary technology that transforms the goals and objectives of professional education (Marino et al., 2023). Developing this conclusion, B. Karan and G. R. Angadi analyze the impact of AI on the lives of students, learning styles, approaches to teaching, and the mechanism of managing an educational organization (Karan, Angadi, 2024). According to M. Esplugas, despite public prejudice regarding the risks of integrating artificial intelligence into the educational process, there is evidence confirming the potential of AI in developing students' communication and analytical skills (Esplugas, 2023).

At the same time, the introduction of AI into the educational process should be accompanied by the expansion of pedagogical practices aimed at teaching media literacy to young people. Training courses to improve the skills of critical perception of information, assessing the risks of its falsification can become a compensator for the destructive consequences of the introduction of AI into the educational process.

4. Results

In the first part of the study, students were asked questions that allowed to identify and reflect on the initial level of their ability to work with the educational material. Thus, according to the obtained results, almost half of the respondents (47.0 %) have difficulties with the assimilation of some of the data. It can be assumed that in the context of scaling information, insufficient attention to teaching media literacy has a negative impact on the learning process as a whole. At the same time, 3.5 % of students noted an extreme degree of misunderstanding of the educational information (the answer "I don't understand anything"). The answers received generally correlate with the self-assessment of students' academic performance. Thus, only 3.3 % of respondents assess their level as "below average", while 39.5 % of students speak of an average level of their academic performance in academic disciplines.

The students' lack of knowledge raises the question of respondents' use of AI in preparation for the learning process. This mostly concerns the use of chatbots based on neural networks (GigaChat, YandexGPT, ChatGPT, Claude, etc.). According to the data obtained, 47.3 % of students give a clearly positive answer, another third of respondents (36.3 %) note fragmentary use of such practices. Compared to the answers to a similar question, but in the context of everyday student practices, the variation range in respondents' answers seems insignificant. The data obtained allow us to conclude that the boundaries of neural network use in the educational and life fields of students are merging (Table 1).

Table 1. The relationship between the use of chatbots based on neural networks in everyday life and in the learning process, %
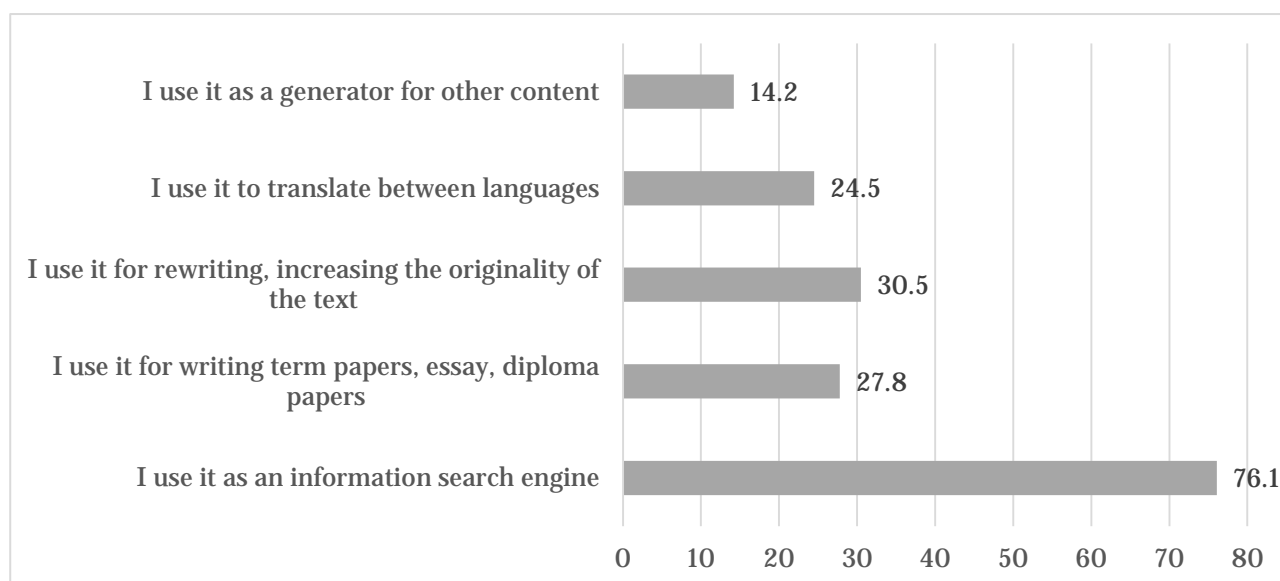
Do you use chatbots based on neural networks (GigaChat, YandexGPT, ChatGPT, Claude, etc.) in everyday life?	Do you use chatbots based on neural networks (GigaChat, YandexGPT, ChatGPT, Claude, etc.) in the learning process?		
	yes	sometimes/rarely	no
yes	79.5	18.5	2.0
sometimes/rarely	14.7	71.0	14.3
no	9.3	19.6	71.1
Sample mean	*47.3*	*36.7*	*15.9*

The results of the study illustrate a stable relationship between the prevalence of AI in everyday life and the use of neural networks in the learning process. The value of the χ2 criterion is

506.618. The critical value of χ2 at a significance level of p = 0.01 is 13.277. The relationship between the factor and result features is statistically significant at a significance level of p < 0.01. The significance level is p < 0.001.

Among active users of chatbots, the share of those who also use them in the learning process is significantly higher (79.5 %, which is 1.7 times higher than the average!). The penetration of AI into the everyday practices of young people is so great that students do not consider it necessary to change the established approach in the academic environment. The obtained results indicate the relevance of issues of media literacy of young people. The widespread use of neural networks increases the competence deficits of young people in the sphere of media consumption, creates risks of manipulation of public opinion.

The dominant target setting of students in using chatbots based on neural networks focuses on finding information necessary for studying (76.1 %). At the same time, there is still a share of students who use AI capabilities as a replacement for their own cognitive efforts to process and analyze information: 27.8 % of students use neural network capabilities to write term papers, essays, and theses (Figure 1).

Fig. 1. Distribution of answers to the question: "For what purpose do you use chatbots based on neural networks (GigaChat, YandexGPT, ChatGPT, Claude, etc.)?" (multiple choice), %

Thus, the use of AI leads to risks of reducing the level of media competence of student youth. The atrophy of student media skills related to searching, primary systematization and critical understanding of educational information, due to lack of demand and ease of replacement with AI tools, can increase its scale and change the educational practices of higher education.

The results of the study showed a certain relationship between students' academic performance and the frequency of using artificial intelligence in the learning process. The most striking differentiation in student assessments isobserved in groups with high and low academic performance (Table 2).

Thus, if in the group of students with a below average level of academic performance they admit that they resort to the help of AI in the learning process – 61.5 %, then among excellent students – 55.3 %. An even more significant variation range in assessments is characteristic of respondents who do not use neural networks (this answer option was chosen by 22.3 % of excellent students and 15.4 % of students with a low level of academic performance). Statistical analysis shows the presence of dependencies between these variables. The value of the χ2 criterion is 15.138. The critical value of χ2 at a significance level of p = 0.05 is 12.592. The relationship between the factor and result features is statistically significant at a significance level of p < 0.05.

Table 2. Relationship between the use of chatbots based on neural networks and students' academic performance, %

How do you rate your academic performance?	Do you use chatbots based on neural networks (GigaChat, YandexGPT, ChatGPT, Claude, etc.) in the learning process?		
	yes	sometimes/rarely	no
excellent	55,3	22,3	22,3
above average	45,3	40,5	14,2
average	45,1	39,6	15,4
below average	61,5	23,1	15,4
Sample mean	*47,3*	*36,7*	*15,9*

Despite the expansion of the boundaries of the use of neural networks in the educational activities of students, respondents are quite cautious in their assessments when it comes to recognizing the subjectivity of AI, transferring part of the functionality to it when planning the academic load. In particular, students are less inclined to agree with AI guiding them in their studies, setting tasks based on the assessment of the level of knowledge and training of the student. More than a quarter of students express doubts about the need for these practices (27.2 % – "not sure"). Almost the same proportion of respondents surveyed expresses a negative opinion (Table 3).

Table 3. Prospects for the use of artificial intelligence in the educational process in students' assessments, %

Do you agree that a chatbot based on neural networks...	*Answer option*				
	Absolutely agree	*Rather yes*	*Not sure*	*Rather no*	*Absolutely disagree*
helped you in finding and mastering the material	35.2	42.7	13.0	4.5	3.8
guided you in your studies, set tasks for you based on your level of knowledge and preparation	19.8	32.1	27.2	12.2	8.7
gave you grades	6.1	12.0	31.4	23.7	26.8

Students are even more repulsed by the idea of transferring knowledge assessment functions to artificial intelligence. Thus, only 18.1 % agreed to have a chatbot based on neural networks give them grades during the learning process. Thus, the results of the study showed that AI, on the one hand, expanded the educational potential of higher education, on the other - caused the formation of new risks. These risks are associated with a decrease in the criticality of student perception of information, his desire to shift the role of an evaluator of media content, its end consumer, to AI. The results obtained indicate the need to expand pedagogical practices for teaching media literacy in the context of large-scale penetration of neural networks into the educational process. In particular, didactic approaches to the development of students' media competence based on the use of AI tools in the preparation of creative tasks, scenarios for business games, and completing practice-oriented cases are considered promising. In addition, to reduce these risks, it is necessary to introduce into the educational process academic disciplines that ensure the development of skills in using AI in the educational process while maintaining and increasing students' competence in working with media content.

5. Conclusion
Modern students use chatbots based on neural networks to write term papers/diploma theses, search for information, and improve the level of text originality. At the same time, one of the most pressing issues of both scientific discourse and educational practice is the problem of defining the ethical boundaries of using AI in students' educational activities. In this context, the development of media education for young people can be considered as a tool for forming ethical standards for working with information.

The results of the study showed the presence of interpretative biases in assessing the potential of AI, the dominance of consumer interests of student youth, focused on using its technologies as a digital assistant, to whom the performance of educational tasks is delegated. The risks of introducing AI into the educational activities of students are due to the leveling of the value of academic work, scientific authorship, a decrease in analytical competencies, and cognitive atrophy of young people.

Despite digital optimism regarding the capabilities of AI in preparing for classes and completing assignments, students were quite skeptical about the prospects for using AI in the practice of grading and organizing the educational process. The insufficient level of application of AI resources in the processes of knowledge control, planning educational and methodological work, and developing individual learning algorithms indicates significant dysfunctions in the processes of digitalization of education.

Pedagogical practices for teaching media literacy should include the following areas to prevent destructive risks of introducing AI into the educational process:

– Analysis of media content generated by AI, its critical assessment and reflection, identification of risks of data falsification;

– Implementation of gamification methods to improve media literacy, skills to identify falsified information;

– Development of prompting skills, to optimize interaction with AI, increase the relevance and accuracy of search queries;

– Research activities aimed at analyzing information systems, forming multi-level queries to AI based on system research and integration of information from various sources;

– Project activities that involve using the creative potential of young people to supplement information generated by AI, create creative content that surpasses the capabilities of AI in its characteristics;

– Broadcasting ethical standards and requirements indicating the inadmissibility of the incorrect use of AI in the practice of completing educational tasks.

Artificial intelligence, as a breakthrough technology of the future, is becoming a new reality that significantly changes the landscape of higher education, including teaching methods, interactions and knowledge control. The key tasks for higher education in the new conditions are finding solutions that allow for the most effective implementation of AI technologies in the educational process in order to improve the quality of education, and the formation of competencies of young people in demand on the labor market.

6. Acknowledgments

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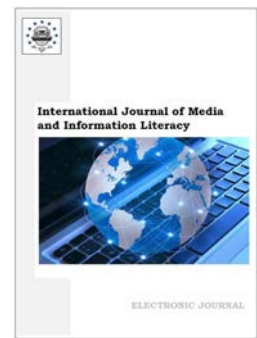
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The Application of Lobbying and Negotiation Techniques in a Good Social Media Literacy Campaign Program on Students' Attitudes at Junior High School

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Abstract

Social media has become a part of daily life for modern society, particularly among teenagers. However, improper use of social media can have negative impacts, especially on young generations, including students at Junior High School Barunawati North Jakarta. In the digital era, social media literacy is an essential skill for everyone, especially adolescents. This literacy involves not only using social media but also understanding the information received, assessing its validity, and making informed decisions. This study explores the application of lobbying and negotiation techniques in social media literacy campaigns to improve students' attitudes towards social media usage. These techniques are effective in enhancing students' understanding and communication skills. The research employs a qualitative approach, focusing on literature review and interview, to understand the implementation and impact of these techniques. Results indicate that lobbying and negotiation positively influence students' attitudes towards social media. Campaign implementation by teachers and support from the government, such as expanding internet access and engaging education are critical for the success of these campaigns. This study provides valuable insights for educators and policymakers in developing social media literacy programs, aiming to foster responsible and informed social media use among students at Junior High School Barunawati North Jakarta.

Keywords: social media, media literacy, junior high school Barunawati, lobbying, negotiation, teachers, student, campaigns, education, digital.

1. Introduction

Using social media, comprehending information, determining its veracity, and making wise decisions are all components of this literacy. To change students' attitudes about social media use, this study investigates the use of lobbying and negotiating strategies in social media literacy efforts. These methods work well for enhancing pupils' comprehension and communication abilities. This study employs a qualitative methodology, emphasizing content analysis and literature review to comprehend the application and effects of this method. The findings of the study demonstrate that negotiating and lobbying strategies

In this digital age, social media literacy is a crucial skill that every person, especially teenagers, should possess. Social media literacy is not just about understanding the information that is being shared, but also about identifying false information, determining which information is false, and forming sound opinions based on the information that they have received. Communication is the state in which there is a person who gives information known as a communicator and receives information known as a communication (Gálik et al., 2024; Murpratiwi et al., 2023).

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When you understand someone's feelings, it can be interpreted as a sign that you are not fulfilling your obligations, and you may even become more relaxed than you were before. The negotiation is a part of daily life, including in business endeavors to influence others and to help others understand. There are a few situations that arise during negotiation happen, such as when a business that we will be negotiating with is not willing to discuss the issues that we have raised. Not only that, but there is also a desire to help others that originate from one or more companies that are able and have a strong sense of duty if they engage in business negotiations, which will hinder their business (Mizanie, Irwansyah, 2019). It is generally accepted that if a person can choose a suitable word, apply it correctly beforehand, and then use it again with precision, it will result in primary communication. However, complete communication effectiveness still requires positive psychological support and a high level of trust. If one party has the power to privately express a particular opinion to other parties, negotiation will not take place.

The level of formality, the subject matter, and the basic parties involved are all related to this article. Negotiation has several qualities according to the parties involved, whether it is their name or their representative. They can quickly make decisions and set boundaries and goals. Conversely, those that negotiate with businesses or organizations are not very strong (Evelina, 2016). However, there are many students at Junior High School Barunawati, Northern Jakarta who do not have adequate social media literacy. They find it difficult to distinguish between genuine and fraudulent information, and they are not very critical when evaluating the information that has been obtained. This can have a very negative impact on students' attitudes and behavior at school and in their surrounding environment. Because of this, we need a social media literacy curriculum that is effective and can help increase the social media literacy of the students at Junior High School Barunawati. This program will use negotiation and lobbying techniques as a means of educating students about the use and consumption of social media.

Two crucial techniques for raising students' awareness of social media are lobbying and negotiation. Lobbying technique is a technique used to enhance a person's performance or abilities. Negotiation is a technique used to solve problems by finding solutions that benefit all parties involved, or it may also be referred to as win-win (Nengsih et al., 2023). Two crucial techniques that can be used in a social media literacy program are lobbying and negotiation. This program will explain how to use lobbying techniques and Negotiation can be used in a social media literacy program that is appropriate for the students at Junior High School Barunawati, Northern Jakarta. It is hoped that by applying lobbying and negotiation techniques, students will be able to understand and learn how to use social media more effectively and responsibly. In addition, it is believed that lobbying and negotiation techniques can help reduce social media tenseness and reduce the risk of a hoax.

Hoaxes are very common since they spread misleading information. The sole purpose of information dissemination is to inform and educate readers or readers so they can understand a piece of news (Laras, Maryani, 2020). Conversely, those who create news understand that the news in question is either a lie or fake. Readers sometimes only read and understand hoax stories, even if they aren't always accurate. The term "hoax" is also derived from the word "hocus," which means "to fool" and it is also like a phrase used as a mantra in magic games, which are based on the types of magic games that are played. From ancient times to the present, the term "hoax" refers to the existence of a news source or even a piece of information that causes people to have feelings, whether they are silent or not.

Lobbying and negotiation are related; they are frequently hindered since they can undermine the credibility of the negotiation process. Discussions can be conducted effectively by carrying out effective lobbying. This negotiation can be seen as a continuation of the two parties' simple agreement. Since the main goal of any negotiation is to find a solution that is agreed upon based on the differences that arise, this process requires two or more important parties, namely the negotiator and the opponent/adviser (Evelina, 2016).

This article will serve as a reference for educators and students who wish to develop a social media literacy curriculum that is appropriate for students. With the information provided in this article, educators and students may create effective and efficient social media literacy programs. In addition, this article will serve as a reference for students who want to learn more about social media and use it.

In this article, we will explain the theory and practice of lobbying and negotiation techniques, as well as how to implement them in a successful social media literacy program. In addition, it will

be explained how to create an effective and efficient social media literacy program. With the information provided in this article, it is hoped that students will understand social media better and use it more effectively, while teachers and educational staff will be able to develop effective and efficient social media literacy programs.

This lack of social media literacy among students at Junior High School Barunawati Northern Jakarta can be caused by several factors, such as the availability of resources, the teacher's lack of understanding, the interesting education, and facilities that are either too difficult to use or too expensive. This can help students who are unable or unwilling to use technology and social media effectively to increase their self-esteem.

One solution that may be used to improve the social media literacy of the students at Junior High School Barunawati is the implementation of lobbying and negotiation techniques in the program good social media literacy campaign towards students' attitudes. The application of lobbying and negotiation techniques will help students understand and comprehend social media concepts, use technology in the best possible way, and develop more effective skills. However, to achieve the best results, a successful social media literacy program must be carried out in a clear and organized manner. This can be done by paying attention to a few things, such as providing a sufficient resource, enhancing teacher skills, addressing student needs, improving teachers' attitudes, and improving facilities. The purpose of the literacy program is to teach students so that they would be able to make sense of their surroundings, make them want to learn, and eventually have more extensive knowledge and new information (Kamardana et al., 2021).

The technique used in lobbying and negotiating must be simple or serpentine (Evelina, 2016). There is a specific obstacle to lobbying and bargaining. Negotiators must learn and understand the many tactics and strategies that are different for lobbying and negotiating companies. Competent skills are necessary for successful negotiation and business development between organizations. Negotiation is a form of communication. Someone who People who give and receive information are referred to as communicators. It is very important for two people to work together to share ideas, knowledge, and understanding so that there is no conflict in conversation. Effective communication can counteract ineffective and clumsy negotiations.

To improve social media literacy at Junior High School Barunawati Northern Jakarta, the government could also take a few steps, such as encouraging students to use social media in class, encouraging internet access, and encouraging innovative teaching methods. Nowadays, social media knowledge is a very important skill for students. Through the promotion of social media skills, students at Junior High School Barunawati in Northern Jakarta can quickly increase their social media skills and develop more effective ones.

Lobbying and negotiation have a very strong bond with the administration or leadership, which usually looks out for the interests of the community. Lobbying itself aims to identify the specific impact and necessity of the successful implementation of the previously developed plan. Lobbying is also frequently used to resolve negotiations between two parties who are located on the dead-end road and are unable to communicate. In the end, the lobbying elicited understanding of this issue from everyone. Conversely, negotiation itself is defined as a strategy used to resolve conflicts between individuals, organizations, communities, and other groups. The goal of negotiation is to reduce the disparity in wealth between the parties that eventually have an agreement. Negotiation is the process of using negotiation to develop an understanding of a certain issue (Sari, Prasetyo, 2020).

argaining power is not only influenced by verbal cues but also by nonverbal ones. Negotiation can be described as a more extensive kind of communication between negotiators in which everything that is done and nothing is done is conveyed to the other negotiator. The use of visual aids (diagram, diagram, etc.) and other visual communication forms, such as appearance, clothing, posture, gait, and symbols of the physical environment, can have varying effects depending on cultural norms (Thompson et al., 2017).

2. Materials and methods

Lobbying and negotiation techniques can be effective strategies for increasing students' understanding of social media (Rianto, 2019). Using Lobbying techniques, students can learn how to persuade others to understand and accept social media content. On the other hand, students can learn how to reach a mutually beneficial agreement through constructive and lively discussions or negotiations. When engaging in negotiations, we must have a shared understanding of the subject

operates efficiently and many other factors that contribute to the lack of success in negotiations (Noer, 2018).

In the process of negotiation, disputing parties may become more understanding, discern differences between them, and possibly even achieve their goals through negotiation. Because the negotiator provides information that the client may not need, negotiations may proceed without interruption (Tinambunan, Siahaan, 2021). Understanding and achieving goals are two things that are always related. According to Hartman, negotiation is the process of two parties communicating with each other that has a common problem and successfully resolves it to satisfy both parties' needs in accordance with their goals and objectives (Tazkiya et al., 2021).

In addition, research conducted in a book titled "Negotiation Skills for Effective Communication in Social Media Literacy Campaigns" indicates that the use of negotiation techniques in social media literacy campaigns can help students develop effective communication skills. Through negotiation and discussion skills, students can learn to work together to achieve goals in social media literacy campaigns (Albuali, 2021).

According to the two studies, the implementation of Lobbying and negotiation techniques in the social media literacy curriculum can have a very positive and beneficial impact on the students at Junior High School Barunawati, Northern Jakarta. It is hoped that with good understanding of social media through lobbying and negotiation techniques, students will be able to use social media in a responsible and respectful manner.

The research method we use in this article is qualitative, which is an approach to knowledge that is used to understand social phenomena, individual behavior, or individual experience through written observation, writing analysis, and interviews. The goal of qualitative research is to clarify and comprehend the complexity of the social context, values, and meanings that underline the phenomena that are being studied. This study aims to improve data interpretation and understanding by statistical generalization (Castleberry, Nolen, 2018). In the qualitative study on the effectiveness of lobbying and negotiation techniques in the media program for students at Junior High School Barunawati, the research question is "How do students at Junior High School Barunawati participate in the lobbying and negotiation techniques in the media literacy program?"

Literacy, according to UNESCO, is a manifestation of the world's rea skills, specifically the cognitive skills, from reading and writing, which is independent of the context in which skills are passed down from one person to another and how they are passed down. A few factors that can influence someone's perception of the importance of literature in general are academic research, institutional research, national context, religious studies, and other research. Literacy may be defined as literacy, the ability to read and write, or the success in doing so. The purpose of this research is to gain understanding about the application of lobbying and negotiation techniques in a social media program that is beneficial to students at Junior High School Barunawati. The literary analysis based on the context of the study is to integrate the skills of writing, reading, and critical thinking.

The goal of research is to understand data, hence the most important step in any research project is data collection methods. The subject of the study is a person or group of people who serve as the subject of the study. In this study, the researcher used a technique intended to identify a study topic with a clear focus, with the aim that the sample that is being used reflects relevant population data. The study's subjects are students from Junior High School Barunawati in Northen Jakarta, who serve as the target audience for a successful social media campaign. The purpose of research is to identify a topic or issue that is very important and to have the information needed for the research. In this study, the objective of research is the application of lobbying techniques and negotiations in a social media awareness program that is beneficial to students at Junior High School Barunawati.

This article's methodology is library study, which is the technique of gathering data by comprehending and learning the theories found in various works of literature that are pertinent to the research. Data collection methods from books and other sources that are pertinent to the topic discussed in this study include price, promotion, and location effects on purchasing decisions. Data collection is the main goal of research; hence data collection methods are the most important part of every research project.

The researchers will not be able to obtain the desired data if they do not understand the data collection method. There are three steps in literary analysis, which are to understand the necessary equipment, understand the bibliography's list, and set aside time to read and analyze the research materials. The process of gathering data involves searching through and gathering information

from various documents, such as books, journals, and existing research. Two analysis methods that are used are descriptive analysis and content analysis.

Descriptive analysis involves analyzing data by describing or describing data that is presented in any way without revealing the results of the analysis for the public or for generalization (Sugiyono, 2019). This type of analysis is used to determine the number of respondents who will be categorized based on identified characteristics. Materials from literature that are derived from many sources are critically analyzed and used to support the arguments and ideas that are made.

3. Discussion

According to the study's findings, using lobbying and negotiation techniques in a social media advertising program had a positive impact on students at Junior High School Barunawati in Northern Jakarta. lobbying is a procedure that consists of several methods to improve an organization's position for individuals, such as government employees and public observers. Business lobbying is the beginning of negotiation (Madiistriyatno, 2023). Through the lobbying approach, the campaign peripherin's can explain the behavior and attitudes of the students related to the use of social media. Nowadays, teenagers are strongly present on social media and choose social media as a means of their news consumption. However, it is important to note that just because young people are avid users of social media does not necessarily mean that they automatically have the skills and abilities to deal with the underload of content, information, misinformation and echo chambers present in the digital sphere. Importing to them concerning media literacy for youth to be identified (Feio, Oliveira, 2025). Conversely, negotiation techniques contribute to resolving conflicts and reaching a consensus that benefits all parties involved.

Regarding the need for this study, the ability of teachers and students to apply lobbying and negotiation techniques is a key component of the success of the social media campaign. Important to Highlight the need to vote in favor of a campaign project elaborated by actors close to the school: teachers, headmasters and parents of student, who have observed the real-life situations in schools in media literacy campaign (Revaz, 2024). For the teacher to implement this technique effectively, they must have a thorough understanding of student behavior and school environment. Teachers are required to set professional standards, favor educational innovation and provide professional advice to students in media literacy (Parcerisa, Verger, 2024). In addition to that, this article highlights the importance of the government's cooperation in enhancing social media literacy among students. It is crucial to establish a conscientious environment for the growth of social media, such as educating people and facilitating internet access.

Negotiations include differences in a person's understanding that are related to the organization (Ramadhani, 2023). Negotiation is a communication activity in a business transaction with no intention of reaching a satisfactory conclusion or a communication process with other parties to reach a satisfactory conclusion (Utami, 2017). Negotiation between two parties with a stake in the matter, namely buyers and sellers, is conducted. Another way to put it is that negotiation is the process of two parties communicating with each other, where each party has a goal and understanding.

A negotiation is a communication process between two parties in which each party has a goal and understanding and they work to achieve an agreement that can satisfy the needs of both parties to a shared problem (Raharjo, 2015). And they are working to reach a level of success that can satisfy the needs of both parties regarding the problem together. According to Indonesian Dictionary (Kamus Besar Bahasa Indonesia – KBBI), negotiation is the process of negotiating a way to reach an agreement between a group or organization and other parties, evaluating a proposal through a peace and negotiating with the relevant parties, and utilizing the results of discussions to reach an agreement. Negotiation is a variety of activities that must be carried out to accomplish a certain goal.

This can also be described as negotiations, which are discussions and conversations that affect the onset of loss or agreement. It can also be used as a tool to help resolve disputes and disagreements that arise during negotiations, sales, business transactions, and other processes. As a result, the negotiation process is carried out in every company with its customers. Negotiation is the process of communicating in a business transaction with no intention of achieving agreement or the communication process with other parties to achieve an agreement (Utami, 2017).

In terms of methodology, qualitative research through literature studies provides insight into the phenomena that are being studied. Analysis and descriptive are the most important tools for

understanding and evaluating research findings. All things considered, this article makes a significant contribution to educational practice and the development of effective social media programs, as well as enhancing students' understanding and utilization of social media in the Junior High School Barunawati Northern Jakarta community. To empower students, teachers must follow various methods and approaches. The best practice of a social media campaign is one such method in which professionally trained teachers engage in social media literacy programs (Baikady, 2025).

We used a qualitative approach in our study, which enabled us to comprehend the phenomenon being studied in greater detail. To understand and evaluate the research findings, we use both descriptive and content analysis. In this way, we can provide more detailed examples and discuss the application of lobbying and negotiation techniques in a social media program that is effective about students at Junior High School Barunawati Northern Jakarta.

In summary, this study's findings indicate that the use of lobbying and negotiation techniques in a social media campaign program has a positive impact on students at Junior High School Barunawati, Northern Jakarta. While lobbying technique helps to reduce conflict and provide win-win outcomes for all involved parties, negotiation technique helps to reduce student behavior and opinion related to social media use. Considering this, this article makes a significant contribution to educational practice and the development of effective social media programs, as well as to the better understanding and utilization of social media by the students at Junior High School Barunawati in Northern Jakarta.

Nowadays, social media literacy is one of the most important aspects of education, especially in the teenager's community. Good social media literacy programs can help students understand the positive and negative effects of using social media and increase their awareness of how important it is to use social media in a responsible manner (Kahne, Bowyer, 2024). Conveyed by individuals, experience with influenced by rational messages is more relevant to the target object. These are Insights for students and teachers in the era of social media, particularly in leveraging the unique appeal of human relationships through online media marketing tools (Wei et al., 2025). In the context of implementing the social media literacy program at Junior High School Barunawati, the use of lobbying and negotiation techniques maintains a crucial role in obtaining the cooperation and active participation of all parties involved, including students, teachers, staff, and school officials.

One of lobbying's main goals in this context is to educate everyone involved, especially the school and teachers, on the importance of the media literacy program. Lobbyists can use pertinent statistics and information to provide strong arguments about the positive effects that the program will have, such as increasing students' awareness of their homes and the value of social media. To strengthen and support the media literacy campaign, aliens should be formed with other groups both inside and outside of the school, such as teenagers' organizations and local communities (Martinez-Cerda, Torrent-Sellens, 2024).

The negotiation process is carried out to get a consensus over the implementation and plan of the media literacy program. Teachers, parents, and other individuals may have concerns or opinions about the program in question, and discussions are held to find solutions that can be agreed upon by all parties Koc-Michalska et al. (Koc-Michalska et al., 2024). Students can also be encouraged to participate in this negotiation process, which will make them more motivated to participate actively and provide them an advantage in the program. Using effective lobbying and negotiation techniques, it is hoped that the social media literacy program at Junior High School Junior High School Barunawati will be able to gain the support of all relevant parties and successfully achieve its goal, which is to increase students' positive attitudes toward using social media.

The implementation of lobbying and negotiation techniques in the social media literacy program is crucial for the students at the Junior High School Barunawati. Lobbying techniques can be used to create strong bonds between the various stakeholders involved in the program, such as the school, the teacher, the student, and other related parties. Through an effective lobbying process, the social media literacy program may gather feedback from all relevant parties, thereby improving the students' performance and attitude (Widner et al., 2025)

Conversely, negotiation techniques are crucial to achieving a goal that benefits all parties involved in the media literacy campaign. In the negotiation process, interested parties can communicate effectively to reach a mutual understanding of the program's goals and benefits and to identify the necessary steps to achieve success together (Manca, Ranieri, 2024). Lobbying and

negotiation activities in this media literacy campaign allow them to adopt bold and innovative environmental practices. The significance and impact of these partnerships from all parties involved showcase the essential roles of multiple stakeholders, including the education department as representatives of government, schools, and school committees. Such collaborative efforts enable each student to harness the unique capabilities, enhancing their capacity to achieve sustainability goals and develop adaptive strategies and innovative solutions for social media literacy challenges (Miao, Nduneseokwu, 2024). Effective negotiation skills are also necessary to address any differences in needs or requirements that may arise during program execution.

4. Results

The social media literacy curriculum at Junior High School Barunawati Northern Jakarta can effectively improve students' attitudes about social media use by implementing lobbying and negotiation techniques. Through strong collaboration among all involved parties and successful negotiation processes, this program has the potential to create a safe learning environment and support students in developing a more thorough understanding of social media and its effects on their daily lives.

After understanding the target, the communicator in the social media literacy program at Junior High School Barunawati Northern Jakarta must discuss the expected responses from the students. This could serve as a better understanding of the importance of social media literacy (cognitive), a change in attitude that is more favorable to the use of social media (effective), or a way to have people use social media more responsibly (behavior). The school administration wants students' awareness and positive attitudes about social media to increase, which will eventually create a healthier and more productive environment for the students. According to the marketing mix concept, the main factor in achieving school goals is the effectiveness of the media literacy program.

This program is a type of educational service designed to increase students' understanding and proficiency in using social media in a responsible manner. This program includes various activities, such as workshops, educational content, counseling, and the development of extracurricular activities related to social media literacy. The goal is to provide students with better understanding of the risks and benefits of using social media so they can use the platform in a constructive and efficient manner.

Once the target audience has been identified and the expected response has been discussed, the facilitator of the social media literacy program at Junior High School Barunawati Northern Jakarta can begin an effective messaging process. This passage answers three key questions: what is the message that needs to be expressed, how to do it symbolically, and who will be the transmitter of message. In this context, proficiency in lobbying and negotiation techniques is crucial for enhancing students' performance. Aspects of this program include flexibility in the lobbying and negotiation techniques to help students gain a hand in enhancing their social media literacy. Negotiation strategies that encourage open communication and persuasiveness can inspire students to participate in this campaign.

In addition to this, facilitators also provide students with insightful information about the need for social media literacy through relevant and engaging exercises. The program's structure emphasizes the importance of lobbying and negotiation techniques that are tailored to the needs and preferences of the students. Students are given the opportunity to choose the teaching methods that best suit their learning styles and to set personal goals for increasing their social media literacy. It is crucial to establish trust with students and ensure their participation in the program as the primary facilitator. Media literacy and digital skills of teenagers are formed, which seems limited to teaching with/through media (Šušterič et al., 2025). Lobbying and negotiation techniques are strategies that are implemented after ensuring that the needs and requirements of the students have been met, allowing them to respond to this campaign effectively.

One of the most important aspects of the social media literacy program at Junior High School Barunawati Northern Jakarta is the implementation of budget for lobbying and negotiation activities. Because promotional activities vary greatly depending on the product context and market conditions, there is no set standard for determining a few significant allocations that should be offered. According to Greenhow, Lewin (Greenhow, Lewin, 2015), there are a few factors that should be considered when determining the promotional impact, such as the product's life cycle, market share, frequency of sales, and the possibility of product substitution. A few methods that are commonly used to determine promotional factors, such as the school's ability method,

the school's percentage method, the competition method, and the goals and task method. Budget constraints are a challenge for school administrators when implementing a social media literacy program for students at Junior High School Barunawati Northern Jakarta. Because of this, it is crucial for schools to ensure that the use of available promotional tools is optimized to meet the goals of the social media literacy campaign.

This study highlights the importance of using lobbying and negotiation techniques in social media literacy programs to improve student performance at Junior High School Barunawati, Northern Jakarta. The study's findings indicate that lobbying techniques are effective in educating students about the use of social media, negotiation techniques aid in resolving conflicts and achieving mutually beneficial agreements. Social media literacy is a kind of emotional intelligence that goes beyond simply being able to use the platform; it also includes the ability to comprehend, analyze, and create opinions based on the information that is provided. Lobbying and negotiation techniques can be effective strategies for enhancing social media literacy among students. While lobbying techniques can help students persuade others, negotiation techniques enable students to reach mutually beneficial agreements through candid discussions. There are informal activities during the lobbying process, as well as persuasive communication that is consistently strong. With the advent of social media, student networks started playing a decisive role in mass mobilization and information circulation which forced student organizations to rethink the campaign media literacy and adapt to the changing and evolving demands of junior high school education (Biswas, 2024).

According to its informal definition, good preparation when lobbying is necessary by providing reliable opinions, indicating the activities that will be carried out for lobbying and the people who want to be lobbying, and other things (Ardianto et al., 2020). However, research indicates that there are still a lot of students at Junior High School Barunawati Northern Jakarta who lack engaging social media. They are easily influenced by information that is not reliable or authentic, and they are not very critical when evaluating the information that is provided. Because of this, it is necessary to implement a program for social media literacy that uses lobbying and negotiation techniques to increase students' awareness of social media use.

The implementation of lobbying and negotiation techniques in this program will help students understand and use social media more effectively. While lobbying techniques will help build relationships between various parties involved, negotiation techniques will help resolve conflicts and reach an agreement that benefits all parties. Accordingly, it is expected that students will use social media in a more responsible and attentive manner. The presence of the internet has overhauled the global educational sector by opening unprecedented doors through e-learning with its worldwide opportunities. The utilization of e-learning resources also remains good ground for promoting social media literacy among students (Tor et al., 2024).

Effective social media literacy programs must consider several factors, such as student needs, teacher effectiveness, and accessible facilities. Government support is also very important in providing long-distance internet access and engaging education. It is hoped that with a well-structured program and strong community, students at S Junior High School Barunawati Northern Jakarta will be able to improve their social media literacy and develop more effective skills. In addition to forming lobbying coalitions in media literacy activities, parties involved in this campaign can form alliances by converting pertinent information—such as locational analysis, economic data, policy, permit conditions, and planning strategies so that this program can continue with a number of rules and principles to be negotiated with the education department as policymakers (Taşan-Kok, 2024).

5. Conclusion

The use of lobbying and negotiation techniques in social media literacy campaigns has had a positive impact on students' behavior and performance at Junior High School Barunawati Northern Jakarta. In summary, this study shows that lobbying and negotiation techniques can be beneficial in enhancing students' social media literacy. Effective campaign implementation not only helps students understand social media more thoroughly, but also encourages them to use it responsibly, reduces the risk of leaking personal information, and increases their ability to deal with challenges in the digital world.

Qualitative research through library studies provides insight into the phenomena being studied. This campaign's success is mostly dependent on the teacher and student's ability to apply

lobbying and negotiation techniques as well as the government's support, such as the need for internet access and stimulating education. All things considered, this research makes a significant contribution to educational practices and the development of effective and efficient social media literacy programs. It is hoped that by implementing lobbying and negotiation techniques, students will be able to comprehend and use social media more effectively, increasing the level of social media literacy among Junior High School Barunawati, Northern Jakarta students.

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Smart Health Monitoring Devices with Artificial Intelligence-Driven Technologies for Health Promotion among University Faculty Members: A Qualitative Study

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Abstract

University lecturers or professors play a pivotal role in shaping the academic landscape, contributing significantly to research output and academic libraries' repositories. Their health status and behaviours are crucial not only for personal well-being but also for sustaining scholarly productivity. The advent of artificial intelligence technologies in healthcare introduces new avenues for improving health literacy among university academic faculty members. Artificial intelligence embedded in wearable devices, virtual assistants, predictive analytics, and diagnostic tools offers personalised health insights, empowering academic faculty members to make informed decisions about their well-being. This exploratory qualitative study, conducted among university teaching faculty in Ghana, investigated their utilisation of artificial intelligence-driven technologies to promote their health and well-being. Using purposive sampling procedure, semi-structured interviews were conducted with 20 academic faculty members aged 50 or younger with over 5 years of teaching experience who use artificial intelligence-driven technologies for health monitoring. The findings revealed that artificial intelligence-driven technologies have the potential to positively influence academic faculty members' health behaviours, promote proactive steps towards healthier lifestyles, and improve well-being. artificial intelligence-driven technologies provide users with early signals of potential health complications; the information they provide should be confirmed with a medical practitioner. The study further revealed academic faculty members and professors' concerns about privacy, potential health risks, and psychological consequences associated with constant self-monitoring using artificial intelligence-driven technologies. The study concludes that these technologies have the potential to promote health literacy, well-being, and behaviour change among university teaching staff.

Keywords: artificial intelligence, digital health technologies, higher education, lecturer well-being, smart health management.

1. Introduction

University lecturers, research fellows, and professors are major stakeholders in academic institutions, as they contribute significantly to the research output hosted by academic libraries. Although university faculty members play essential and demanding roles in teaching, research, and service, studies consistently show that only a small percentage maintain a normal body mass index, healthy eating, or engage in adequate levels of physical activity. For example, de Barros Rocha et al. (2023) observed that 70.3 % of university professors from a private educational institution in Brazil

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were overweight. In Jordan, Shnaigat et al. (2025) reported that 48.1 % of male and 50.0 % of female professors were overweight.

In addition to lifestyle-related challenges outlined, academic faculty in low-resource settings, such as Ghana, often experience high levels of work-related stress due to excessive workloads and limited institutional support (Lawer et al., 2025). Research indicates that, under these pressures, many faculty members resort to maladaptive coping strategies-approaches that may provide temporary relief but ultimately undermine their well-being. Due to demands of their job, university faculty experience a sedentary lifestyle, high risk for cardiometabolic conditions, and other related complications (Alinaitwe et al., 2024). In response to unhealthy lifestyles and adverse job demands, academic faculty members are now building health literacy (Abor, Tetteh, 2025).

According to the World Health Organization (2024), "health literacy means being able to access, understand, appraise and use information and services in ways that promote and maintain good health and well-being." Thus, health literacy is a determinant of health and an essential factor in health promotion (World Health Organization, 2024). As the world transitions into more advanced digital technologies, smart healthcare plays an impressive role in health literacy.

Smart healthcare refers to an artificial intelligence (AI)-driven system that uses technologies such as wearable devices, the Internet of Medical Things (IoMT), advanced machine learning tools, and wireless communication to easily access health data, connect people and resources, and respond more effectively and intelligently to health-related needs (Muhammad et al., 2021). Smart healthcare devices have become helpful for monitoring symptoms, diagnosing, treating, and preventing diseases, and for enhancing doctor-patient relationships, especially in cases of cardiometabolic health (Ullah et al., 2023).

These devices provide several key benefits, including the ability to track health in real time, identify problems early, support remote patient care, and inform decision-making (Ullah et al., 2023). AI-Driven technologies can be used to empower, monitor, receive, process and understand fundamental health information and services required to make good health decisions (Al Kuwaiti, 2023). For university academic faculty members to be health-conscious, there is a need for them to take advantage of AI-driven healthcare technologies that have proven to be game changers in healthcare delivery (Aggarwal et al., 2023; Bajwa et al., 2021).

It is noteworthy that academic faculty members with high health literacy can communicate more effectively about their health. Also, the use of AI technologies will give them easy access to information about their health risks and to healthcare promptly (Božić, 2024). Also, utilising these smart devices will promote remote care and health decision-making with accurate data. At the same time, they come with challenges, as concerns about data privacy, technical difficulties, and the need for clear regulations to ensure safe and effective use (Ullah et al., 2024).

Despite the widespread integration of AI into higher education and healthcare in resource-constrained settings like Ghana (Bervell et al., 2025; Sarfo, 2024; Sarfo et al., 2024), the utilisation of such technology to enhance academic faculty members' health literacy remains relatively understudied. This study aligns with several Sustainable Development Goals (SDGs); SDG 3 (Good Health and Well-Being) and SDG 4 (Quality Education), as healthier and more knowledgeable faculty enhance teaching quality and academic productivity. Additionally, the research reflects SDG 9 (Industry, Innovation and Infrastructure), SDG 10 (Reduced Inequalities), and SDG 17 (Partnerships for the Goals) by highlighting the need for collaboration among educational institutions, healthcare providers, and technology developers to implement such tools effectively.

Therefore, the objective of this research is to address this gap by examining the potential concerns associated with this phenomenon. Specifically, the study explored the use of AI-driven technologies, such as wearables, mobile applications, and software, to monitor academic faculty members' health statuses.

2. Methodology
Study Design
To gain a thorough understanding of the phenomena being investigated, the researchers used exploratory qualitative research technique. Exploratory qualitative research is beneficial in determining the complete nature of a little-understood phenomenon (Polit, Beck, 2012). This research approach is excellent for examining the health literacy of academic faculty members in Ghana.

Population

The study's population included academic faculty members in Ghana. The inclusion criteria included the following three criteria: (1) having taught for more than five years, (2) being under the age of 50 years, and (3) use AI-Driven technologies for health.

Sample and sampling procedure

The non-probability sampling method (purposive) was used to select 20 academic faculty members at saturation (Sarfo et al., 2021). According to Morse (2015), saturation in the qualitative data is reached after conducting 12 interviews, and broader themes emerge after six interviews. Regarding their ages, they were aged 50 or younger with over five years of teaching experience who use artificial intelligence-driven technologies for health monitoring. Participants used various AI-driven technologies, including heart rate monitors, blood pressure monitors, step trackers, calorie monitors, weight trackers, body mass index monitors, and pedometers. These monitors were integrated with smartwatches, which were further connected with apps that were integrated with smartphones.

Data Collection

Following ethics approval, participants were contacted, informed about the purpose of the study, and their consent was obtained. Participants were assured of their confidentiality and anonymity. Using a semi-structured interview guide, we conducted individual face-to-face interviews with our participants. During data collection, all interviews were audio recorded. Note-taking during the data collection phase allowed the researchers to capture key points, observations and insights in real time during the interview process. Additionally, the researchers ensured qualitative rigour along with reflexivity (Sarfo, Attigah, 2025). Most academic faculty members were interviewed on the spot in their offices, whereas appointments were scheduled for those who preferred to be interviewed later. Interviews lasted between 35 and 50 minutes. Data were collected over two weeks (14th to 29th February 2024).

Data Analysis

The audio-recorded interview data from the participants were transcribed using the Whisper software and exported to Microsoft Word. Reflexive thematic analysis of the transcribed data was done by following Braun et al.'s (2023) six-phase approach, noting researchers' subjectivity and practising reflexivity (Sarfo, Attigah, 2025). At the end, recurring themes, categories and sub-categories were noted, and conclusions and inferences were drawn from the data and reported.

Ethical Considerations

The research strictly adhered to the principles of voluntary participation as outlined in the Declaration of Helsinki, including informed consent, confidentiality, and data anonymisation, to ensure the protection of participants' rights and privacy throughout the study. All data collected were anonymised and handled confidentially, with participants fully informed about the nature and purpose of the research. Additionally, participation in the study was voluntary, and participants were free to withdraw at any stage without facing any repercussions. The study also ensured that the research procedures and data collection methods posed no harm or risk to participants.

3. Results

The reflexive thematic analysis identified five broad themes that reflect how academic faculty members discussed using their health devices and apps. These themes include: 1. Motivations for Using AI-Driven Technologies, 2. Frequency and Duration of Use, 3. Perceived Effectiveness of AI Technologies, 4. Influence on Health Behaviour, and 5. Challenges and Concerns of AI Use. Please see Table 1 for details.

Table 1. Reflexive thematic analysis of AI-driven health technologies use

Superordinate Theme	Subordinate Theme	Description	Supporting Extracts
1. Motivations for Using AI-Driven Technologies	Health Monitoring	Participants primarily use AI technologies to track vital health indicators such as heart rate, BP, oxygen levels,	"I use the heart tracker to monitor my heart rate and rhythm…" (P1).

Superordinate Theme	Subordinate Theme	Description	Supporting Extracts
		steps, sleep, and calories.	"I use wearables and phone apps to monitor my health." (P15).
	Health Consciousness	Health conditions and preventive intentions motivate adoption.	"A BP condition took me to the hospital... that is why I got this AI technology to monitor my health." (P1). "The reason is the health aspect itself." (P20).
	Connection to Smartphones	Devices are connected to phones for easier monitoring.	"[smart health device] is actually connected to my phone." (P15).
2. Frequency and Duration of Use	Daily Usage	Most participants use their devices daily to manage health.	"I use the app always... because I have diabetics and blood pressure." (P15). "I walk 5 kilometers at least... every day." (P18).
	Long-Term Engagement	Usage ranges from 2–10 years, with most under 5 years.	"I used the wearables for almost six years now." (P15). "...for the past three years." (P4).
	Routine Integration	AI technologies have become part of everyday life.	"Using AI-Driven technologies has been my routine, it's part and parcel of me." (P19).
3. Perceived Effectiveness of AI Technologies	Behaviour Prompting	AI reminders encourage walking, hydration, rest, and sleep.	"Every two hours it will tell me what I need to do." (P20). "...it prompts me to... stand up." (P17).
	Early Detection and Alerts	AI provides early signals of potential illness.	"It can give you some early signals... warning on some upcoming ill health." (P9, P12).
	Medical Validation	Participants believe AI data must be confirmed by doctors.	"I report to my doctor... to discuss the health alerts." (P19).

Superordinate Theme	Subordinate Theme	Description	Supporting Extracts
			"You are not supposed to depend on it entirely." (P4).
4. Influence on Health Behaviour	Increased Physical Activity	Participants walk more, use treadmills, climb stairs due to prompts.	"I always want to close those rings." (P3). "I try to climb up the stairs." (P4).
	Diet and Lifestyle Changes	Health data influences food choices and hydration habits.	"That will inform even the choice of food I have to take." (P11). "... I drink about 5 to 10 bottles of water a day." (P20).
	Personal Discipline and Mindset	Behaviour change depends on user commitment.	"The phone itself will not change the behaviour. ... I mean I have been using iPhone since but I was not conscious of my health. Therefore, it is not actually the phone that is changing the behaviour, it has to be your mindset... (P11). "Its ineffectiveness is as a result of me not being strict." (P2).
5. Challenges and Concerns of AI Use	Psychological Stress	Some users feel anxious when confronted with negative health data.	"Some colleagues told me that they don't use AI technologies anymore because just by checking and knowing that they are stressed or they have not had enough sleep alone stresses them." (P1).
	Time and Technical Demands	Configuration and learning require time and effort.	"I've just not had time to configure all that or study the products." (P20).
	Health and Safety Concerns	Fear of radiation or physical harm from devices.	"If you put two phones here and here... you are burning yourself." (P2).

4. Discussion

Our qualitative findings indicated that AI-driven technologies improved academic faculty members' health literacy, providing real-time data and motivating them to achieve health goals. Participants reported using AI-driven technologies, such as heart rate and blood pressure

monitors, step trackers, and weight-loss devices, to provide insights and motivation to monitor their health regularly. The inclusion of smart wristwatches and devices such as Alexa further expands the capabilities of AI for health monitoring and management in people's lives. The connectivity of these devices to their smartphones enhances accessibility and convenience. With data synchronising seamlessly across devices, academic faculty members can easily monitor their progress, set goals, and receive personalised recommendations to improve their health.

These findings affirm the assertions by Božić (2024) and Nutbeam (2023) that utilising AI technologies empowers individuals to articulate their symptoms, express their concerns, and raise questions, thereby fostering a collaborative and transparent partnership with their healthcare providers. The integration of AI into health and wellness routines represents a significant advancement in empowering academic faculty members to manage their health proactively. However, while the proliferation of AI-driven health technologies offers numerous benefits to academic faculty members, it is essential to consider factors such as data privacy, measurement accuracy, and the potential for overreliance on technology.

The effectiveness of AI technologies in improving academic faculty members' health literacy knowledge is promising, as shown in this study. The findings demonstrated that the AI technologies used by academic faculty members are valuable in providing insights into their health status, identifying potential issues, and promoting proactive healthcare management. This finding is consistent with Dunn and Hazzard (2019), who reported that emerging technologies can improve health literacy. It is crucial to acknowledge participants' comments regarding the need to verify the health information provided by these technologies with a medical practitioner. Thus, despite advances in AI, these technologies sometimes produce inaccurate or misleading results, necessitating medical expertise to interpret and contextualise health data generated by AI.

AI-driven health monitoring technologies should be used as complementary tools rather than substitutes for professional medical advice. They can serve as early warning systems, alerting individuals to potential health concerns and prompting them to seek appropriate medical attention. This collaborative approach, where AI technologies provide signals or indicators that prompt human intervention, can enhance holistic healthcare delivery among academic faculty members. A high level of health literacy is significantly more advantageous than low health literacy. Low health literacy can impede the effective use of online health information for risk prevention and health promotion, as individuals may have difficulty assessing its accuracy (Pisl et al., 2021).

The findings suggest a significant positive impact of AI-driven technologies on the health behaviour of academic faculty members, with most participants reporting changes in their habits due to the guidance provided by the AI technologies they use. The participants in this study use AI-driven technologies to enhance their health literacy. The use of AI-enabled smartwatches, in particular, appears to have influenced behaviour by providing timely reminders and suggestions. Most participants mentioned that the AI smartwatch prompted them to drink water or stand up after prolonged sitting, indicating a proactive approach towards health management. These reminders likely increase awareness and motivation to adopt healthier habits, such as staying hydrated and avoiding prolonged periods of sedentary behaviour. It is notable that although some participants may not respond immediately to the AI's prompts due to work or other commitments, they still make an effort to comply with the suggestions later. This highlights the flexibility and adaptability of AI-driven technologies in accommodating users' varying schedules and lifestyles.

These findings demonstrate the potential of AI to improve academic faculty members' health literacy and promote positive health behaviour change through personalised, timely interventions. By leveraging AI's capabilities to deliver tailored recommendations and reminders, academic faculty members are empowered to take proactive steps toward improving their well-being and to engage in collaborative decision-making with healthcare professionals, thereby enabling them to make well-informed choices about their healthcare (Božić, 2024).

Notwithstanding the increased feedback on utilisation, some participants expressed concerns about the utilisation of AI technologies in relation to personal health and well-being. Apprehension about holding a phone while walking, rather than keeping it on the body, demonstrates heightened awareness of potential health risks associated with prolonged exposure to electronic devices. This concern aligns with ongoing debates and studies about the possible effects of electromagnetic radiation emitted by smartphones and other wireless devices on human health. By holding the phone away from the body, the participant is actively attempting to mitigate perceived risks, underscoring the importance of informed decision-making when using technology.

In addition, a participant's discussion of experiencing increased stress from simply knowing their stress levels or lack of sleep via AI-powered monitoring tools highlights the potential psychological implications of constant self-monitoring. While these technologies aim to provide valuable insights into one's health status, they can also inadvertently contribute to increased anxiety or stress levels. The participant's reluctance to configure such tools for usage reflects a thoughtful consideration of the potential negative impacts on mental well-being.

These concerns emphasise the need for a balanced approach to the integration of AI technologies in healthcare and personal wellness. While these tools offer immense potential for improving health outcomes and promoting preventive care, it is essential to address and mitigate potential risks and drawbacks. This includes providing clear and accurate information on the possible health implications of AI use, as well as guidance on how individuals can use these tools responsibly to enhance their overall well-being without compromising their physical or mental health.

5. Conclusion

This study explored how academic faculty members use health-tracking devices and related digital tools. Participants were primarily drawn to these tools to improve their health monitoring, particularly those who had previously experienced blood pressure concerns, stress, or other medical conditions. This study found that AI-driven technologies significantly improved university faculty members' health literacy knowledge and practices by providing real-time, individualised health data and actionable insights. Smartwatches, activity trackers, heart rate monitors, and virtual assistants such as Alexa provide practical and accessible tools for preventive health management. The integration of these technologies enabled seamless monitoring, goal setting, and access to personalised advice, fostering a more health-conscious academic community. Furthermore, it can be concluded that while academic faculty members are increasingly motivated to use these technologies, concerns persist around privacy, accuracy, and psychological impacts. Participants appreciated the technologies' reminders and health prompts, which motivated lifestyle changes such as increased hydration and reduced sedentary behaviour. At the same time, the concerns they raised-stress caused by particular readings, difficulty learning device features and doubts about long-term use show that these tools are not a simple solution. Overall, the study highlights that digital health devices could support healthier habits, but the extent of their influence depends heavily on how individuals engage with them.

6. Limitations and Strengths

This study has a few limitations that should be acknowledged. The findings are based on participants' self-reported experiences. The study was also limited to academic faculty members within a single setting, and their experiences may differ from those in other professions, age groups, or locations. In addition, the study did not track health behaviour over time, thereby limiting the analysis to participants' reflections at a single point in time.

Despite these limitations, the study has notable strengths. The interviews provided detailed and meaningful insights that allowed for a deeper understanding of how digital health tools are used in the everyday lives of academic faculty members. The reflexive thematic approach also allowed us to capture subtle concerns and motivations that may not have surfaced through other methods.

7. Recommendations

In light of the study's findings, the following recommendations are made.

Interventions that provide simple instructions or brief orientation sessions could help new users use the tools more effectively. Additionally, there is value in strengthening the link between personal health-tracking devices and formal healthcare systems. Also, institutions such as universities could consider integrating these tools into their well-being initiatives, especially given the sedentary nature of academic work. Encouraging responsible use without creating pressure or anxiety about the readings could support healthier routines for staff. Finally, future research could explore how different groups use similar tools and examine behaviour over more extended periods.

8. Declarations
Acknowledgement

Authors' contributions

All authors (GT-C, M-AC, PN, and JOS) conceptualised and designed the study. GT-D collected the interviews. All authors analysed, reviewed and wrote the initial draft. All authors read and approved the final version of the manuscript for publication.

Ethics approval and consent to participate

This study was part of a larger research project that received ethical approval from the Institutional Review Board of the University of Cape Coast (ID: UCCIRB/EXT/2023/56). All sources were cited correctly, and the review adhered to strict standards of academic integrity and transparency throughout the process.

Availability of data and material

All data generated or analysed during this study are available online as published articles.

Competing interests

The authors declare that they have no competing interests.

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Mainstream Media in Greece: Small-scale Bias Experiment on Information Scientists

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Abstract
The aim of this study was to assess whether fact-checking methods improve the critical evaluation of news content and mainstream media outlets that disseminate it, and to what extent personal biases influence these assessments. The study explored these through a controlled pilot experiment involving eight academic information scientists and including audio excerpts from six Greek mainstream television channels, all reporting on the same political event, anonymized to ensure blind evaluations. Participants completed a questionnaire incorporating Pew Research Center tools to assess their political orientations and they applied the Media Bias/Fact Check methodology. Findings reveal high perceived bias in all evaluated media outlets, with stronger right-wing classifications emerging when the identities of the outlets were known. Predominantly left-leaning participants demonstrated improved evaluative consistency using MBFC; however, ideological leanings still influenced outcomes. The study highlights the persistence of confirmation bias among trained individuals and underscores the complexity of achieving objective media evaluations. This work contributes to Media and Information Literacy by piloting a replicable framework for detecting bias in mainstream media and in individuals. While limited in scale, it offers valuable insights for future large-scale studies and educational interventions aimed at enhancing critical media consumption and reducing susceptibility to misinformation.

Keywords: fact-check, mainstream media, bias, media and information literacy.

1. Introduction
The mass media is a force to be reckoned in today's modern society. It serves as a critical agent in distributing news and information on a global scale. Throughout history, it has taken many forms, from wooden plates in Rome to newspapers with the invention of the printing press. It continues with radio, television, and the Internet as we know it today. The media is essential for shaping public opinion and influencing social and political discourse. With its potential to inform and influence the public, mass media has become a powerful tool for those who control it, offering worldwide reach and access to diverse demographics (Conboy, Steel, 2015).

The mass media plays a gatekeeping role in controlling the flow of information. However, this role can contribute to a distorted image of society, as limited time for news coverage forces the media to selectively present content to the public. To illustrate this point, one may consider the limitations of a window in a house, which cannot provide a comprehensive view of the world. The time available for reporting cannot encompass the entirety of an event in an article or report, except in a selective manner. This selectivity in the presentation of information creates a fertile ground for the possibility of agenda setting (McCombs, 2014).

The agenda, and particularly the theory of agenda setting, refers to how the media's selective coverage assigns disproportionate value to societal problems that can be considered important.

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This theory is based on two key components. The first highlights that the media filters what we see by prioritizing issues that capture the public's attention, rather than those essential to their daily lives or livelihoods. The second component addresses the attention that the media gives to societal issues; particularly, the more attention it devotes, the higher its value becomes in the eyes of citizens. In other words, the media does not dictate what to think or how to think about specific issues; it merely signals which issues we should pay more attention to (McCombs, 2014).

The mass media's significant power to select and frame content plays a crucial role in guiding public opinion and shaping how people perceive current events and issues. Beyond informing, the media can challenge dominant ideologies, influence political attitudes, and establish cultural norms. This influential role has sparked ongoing debates about the limits of media freedom, particularly in democratic societies, where the media is expected to function both as a mirror of society and as a watchdog. Concerns also persist about the concentration of media ownership and the impact of commercial and political interests, which may undermine journalistic independence. These issues are further intensified in the digital age, where algorithms and corporate agendas add new layers of complexity to an already fragmented media landscape (McChesney, 2015).

The narratives and the voices that mass media choose to highlight can have a devastating impact on society if not handled ethically. By bringing topics into public awareness through specific interpretive lenses, the media can influence public opinion, political debates, and policymaking, to name a few. These selective practices may validate some worldviews and marginalize others, reinforce systemic inequality, or, conversely, empower social movements and previously silenced voices. In this sense, media do not merely reflect societal values; they actively construct them, often becoming a powerful agent of historical change and social evolution (Couldry, 2012).

On the other hand, information science professionals serve as vital navigators in today's oversaturated information landscape. With the enormous growth of digital content, misinformation, and algorithm-driven platforms, their role extends beyond information retrieval and management to encompass information literacy among the public. Information literacy is a set of competencies, and social practice deeply embedded in context (Lloyd, 2010). Moreover, information professionals must maintain a high level of literacy and critical thinking skills to model best practices (Julien, Genuis, 2011). This requires engaging with the evolving nature of digital information production and dissemination environments.

To empower communities, there is a need to communicate the operations of mass media and educate people on how media shapes narratives and public perceptions. Information scientists can bridge this gap by integrating media and information literacy into their outreach efforts, helping individuals become conscious consumers and ethical information producers. Media literacy involves understanding the media's role in democratic participation and societal power dynamics (Mihailidis, Thevenin, 2013) and critical media literacy is essential for civic engagement that can be fostered through education which blends technological and analytical skills (Hobbs, 2010). Therefore, information professionals need to internalize these concepts, ensuring their deep understanding before disseminating them to the public.

Furthermore, one of the main aspects of critical thinking in today's rich media environment is to acknowledge and eliminate self-bias, because it contributes to polarization, diminishes trust in the news media, and obstructs effective collective action against misinformation. Research shows that intense political partisanship makes people more likely to believe they are better at spotting fake news than those who hold opposing political views (Sude et. al., 2023). A crucial question is how effectively well-informed information scientists can empower others to engage in critical news consumption while also remaining aware of, and resistant to their own biases, particularly self-enhancing perceptual biases.

Considering these issues, the present work presents an experiment that examines the relationship between the news published by mainstream media in Greece and its perception and evaluation by a small target group of experienced information scientists. Although this work is a small-scale experiment focusing on Greek media, it seeks to complement the broader international discourse on this subject by encouraging researchers to further test its efficacy and validity under diverse circumstances, namely, to serve as a pilot or model for scaled studies in academic environments.

2. Materials and methods

The methodological approach involved a small-scale, anonymous experiment designed to explore two key research questions:

Q1: How effectively can an individual, specifically an information scientist, evaluate news when well-informed about a fact-checking method applied to media outlets and news items?

Q2: To what extent does personal bias influence their evaluation outcomes?

The experiment took place in September 2022 and involved a targeted participant group consisting of 18 full-time teaching staff members from the Department of Archival, Library, and Information Studies at the University of West Attica. This group was selected based on the assumption that their academic background in various areas of information science would enable them to understand a fact-checking method more effectively than individuals with less expertise. Moreover, their professional experience was expected to support a more objective evaluation of news content, potentially with a lower susceptibility to bias.

Out of the 18 individuals invited, 8 full-time faculty members agreed to participate in the anonymous experiment, representing approximately 44 % of the total.

In the first stage, 9 mainstream Greek television channels were identified: *ANT1* (Antenna TV, 2025), *ALPHA* (Alpha TV, 2025), *ERT1* (ERT, 2025), *ERT2* (ERT, 2025), *ERT3* (ERT, 2025), *MEGA* (MEGA TV, 2025), *OPEN* (Open TV, 2025), *SKAI* (Skai TV, 2025), and *STAR* (Star Channel, 2025). Using data from Nielsen (Nielsen Audience Measurement, 2022), a trusted source for television ratings, the viewing statistics from September 26 to October 2, 2022 (coinciding with the planned experiment period) were analyzed. Two channels with significantly lower audience shares were excluded based on these ratings.

The next phase involved reviewing the websites of the 7 remaining channels (*ANT1*, *ALPHA*, *ERT1* referred to as *ERT*, *MEGA*, *OPEN*, *SKAI*, and *STAR*), which typically feature video excerpts from their news bulletins. The aim was to identify a single political news item that had been reported across all selected channels, enabling a horizontal comparison of how different media outlets presented the same event. Among the major issues in Greek political discourse at the time was the 2022 Greek surveillance scandal (Wikipedia contributors, 2024), hereafter referred to as *Eavesdropping*, which was ultimately chosen as the news item for the experiment.

However, excerpts of the selected news item were not available on all channel websites, posing a challenge to the experiment. To address this, the researchers turned to the official YouTube channels of the 7 selected media outlets. Video segments relevant to *Eavesdropping* were located on the YouTube channels of 6 broadcasters, with *SKAI* being the exception; during the study's planning period, the *SKAI* channel did not host any video content related to *Eavesdropping*. Consequently, *SKAI* was excluded from the final sample.

The 6 remaining video excerpts, relevant to *Eavesdropping*, were converted into MP3 audio files to obscure the identity of each media outlet. These anonymized audio clips were then embedded into the experiment's main tool, namely the questionnaire.

To examine how participants' political beliefs might influence their assessment of news items, the study incorporated a political typology developed by the *Pew Research Center* (Pew Research Center, 2021). Integrating this tool into the questionnaire enabled researchers to determine each participant's political profile and combine it with their Media Bias/Fact Check evaluations, hereafter *MBFC of 2022* (Media Bias/Fact Check, 2022).

To construct the scientific framework of the questionnaire, the research employed *MBFC of 2022* (Media Bias/Fact Check, 2022). Founded in 2015 by Dave M. Van Zandt, *MBFC* evaluates political bias and factual reporting using a combination of objective measures and subjective analysis. For the purposes of this study, *MBFC of 2022* was chosen for its established reputation in media research and its capacity to assess sources based on four main criteria: (1) wording and headlines, (2) fact-checking and sourcing, (3) story selection, and (4) political affiliation. Additional subcategories included bias by omission and use of language. *MBFC of 2022* rates factual reporting on a seven-point scale and categorizes political bias along a spectrum from extreme-left to extreme-right. Other labels, such as Pro-science, Conspiracy/Pseudoscience, and Satire, are also used for classification purposes.

The platform relied on independent reviewers affiliated with the International Fact-Checking Network and adheres to its Code of Principles (International Fact-Checking Network, 2025). While *MBFC of 2022* had been widely adopted in academic and professional contexts, often showing strong agreement with ratings from other platforms like *NewsGuard Technologies* and *BuzzFeed India* (NewsGuard Technologies, 2025; BuzzFeed India, 2025), it had also faced criticism. Scholars and institutions such as the Poynter Institute had questioned its scientific rigor (Funke, Mantzarlis, 2018; Pennycook, Rand, 2019). The *Columbia Journalism Review* had also pointed out its

susceptibility to subjective judgment (Wilner, 2018). Nonetheless, *MBFC of 2022* remained a widely used tool for evaluating media bias and misinformation, contributing to projects like the *Iffy Quotient*, which tracks the spread of unreliable information on social media (Center for Social Media Responsibility, 2025).

For this experiment, *MBFC's of 2022* original factual rating scale for media sources 0 to 10 (0–2 = Least Biased, 2–5 = Left/Right Center Bias, 5–8 = Left/Right Bias, 8–10 = Extreme Bias) was adjusted to a range of 1 to 10 (1–2 = Least Biased, 2–5 = Left/Right Center Bias, 5–8 = Left/Right Bias, 8 – 10 = Extreme Bias) to comply with *Microsoft Forms'* requirements, the software used to create the questionnaire, which only support ratings from 1 to 10.

These tools are particularly relevant for information scientists because they align directly with the core responsibilities of evaluating, organizing, and disseminating reliable information in digital environments. Unlike general audiences, information scientists are professionally trained to assess the credibility of information, navigate complex digital sources, and implement systems that support informed decision-making (Kaeophanuek et al., 2018). Their roles in promoting media and information literacy, including teaching others how to identify misinformation and use digital tools critically, closely intersect with the goals of these tools, which are designed to enhance critical evaluation skills and support responsible information consumption.

The questionnaire, developed using *Microsoft Forms*, was designed to ensure participant anonymity and support efficient data analysis. It comprised 56 questions, divided as follows:

13 questions were taken and adapted from the *Pew Research Center's* political typology framework to determine participants' ideological orientation (Pew Research Center, 2021).

36 questions, based on *MBFC of 2022*, were tailored to the 6 selected television channels and their coverage of the *Eavesdropping* news item (Media Bias/Fact Check, 2022).

The remaining 7 questions covered experimental instructions.

(For the full questionnaire, see Annex.)

The use of our model method can be well justified, particularly in light of recent advancements in fact-checking tools. The 2025 update of the Media Bias/Fact Check (MBFC) method significantly enhances its credibility by introducing a more systematic and transparent evaluation framework. By adopting a quantitative, weighted scoring system, MBFC of 2025 addresses earlier criticisms of subjectivity and offers greater objectivity, reproducibility, and clarity. Each factor contributing to the final rating is explicitly broken down, making the evaluation process more understandable and accessible for users (Media Bias/Fact Check, 2025).

While our experiment utilized the *MBFC of 2022*, the framework itself remains adaptable and can be employed with any structured fact-checking method in future research. This flexibility ensures the continued relevance and applicability of our approach in evolving media and information environments (Figure 1).
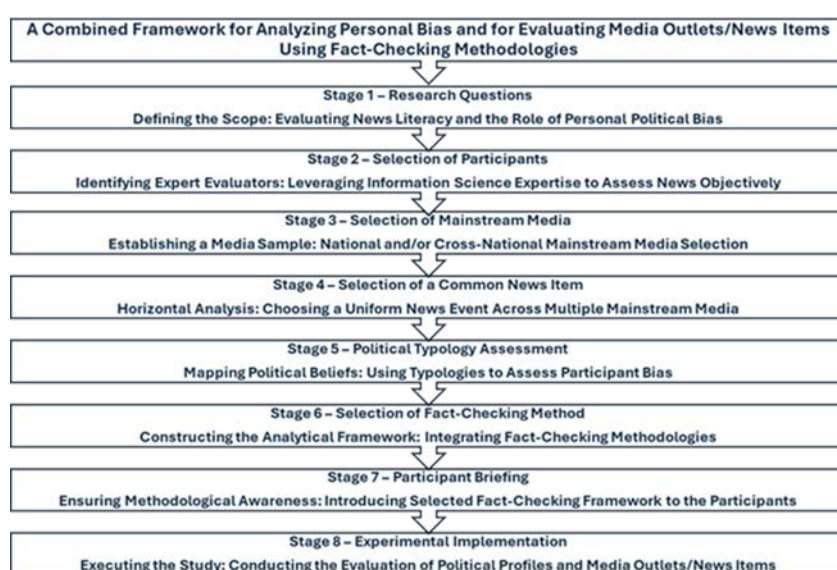
Fig. 1. A combined framework for analyzing personal bias and for evaluating media outlets/news items using fact-checking methodologies

3. Discussion

Evaluating media content, as well as the media outlets that produce and disseminate it is a central concern for information scientists in the age of digital information overload and misinformation. The spread of misinformation, along with the evolving nature of political and emotionally charged content, makes the need to strengthen critical evaluation skills through educational interventions more relevant than ever. However, human psychology, personal beliefs, and the structural biases of the media ecosystem continue to influence even trained evaluators. Considering these points, the following discussion is based on a review of contemporary literature. It focuses on two main research questions, as mentioned in the Materials and Methods section of this paper.

The literature highlights the importance of structured methodologies for evaluating media content. *MBFC's of 2022* approach aligns with established frameworks, such as Caulfield's four-step verification method, which involves checking for previous work, identifying the source, reading laterally, and circling back for reassessment (Caulfield, 2017). These methods aim to enhance critical thinking and reduce susceptibility to misinformation. *MBFC's of 2022* ratings have been widely used in media studies and disinformation research due to their reliability and consistency over time. For instance, as mentioned earlier, comparisons with other datasets, such as *NewsGuard Technologies* and *BuzzFeed India*, demonstrate strong agreement in identifying biased or low-factual news sources (Broniatowski et al., 2022; Kiesel et al., 2019).

Studies emphasize that fact-checking tools enhance evaluative accuracy by systematically targeting multiple critical dimensions such as emotional framing, rhetorical manipulation, and ideological bias (Baly et al., 2021). In addition to analytical rigor, *MBFC of 2022* also offers a robust, continually updated database of media sources, allowing users to access bias ratings and factual reliability assessments across thousands of news websites (Babaei et al., 2022). Furthermore, findings from the literature indicate that individuals who undergo training in structured frameworks are more adept at recognizing manipulative headlines, emotionally charged wording, and the origins of misinformation (Lewandowsky et al., 2012; Nakov et al., 2021). These outcomes are corroborated by other scientists' work, which confirms that content literacy education significantly enhances the detection of deceptive patterns in both digital and traditional media landscapes (Ali et al., 2022; Amazeen, Bucy, 2019).

Research indicates that employing multiple evaluation points, such as those incorporated in the *MBFC of 2022* framework, effectively mitigates the influence of superficial cues that might otherwise mislead untrained or inattentive individuals (Pomares, Guzmán, 2015; Truong, Tran, 2023). Participants who closely followed structured fact-checking criteria consistently delivered more accurate and calibrated assessments. This reinforces the broader claim that methodical, multi-step verification processes significantly reduce vulnerability to various forms of bias. Moreover, individuals who are well-informed about fact-checking strategies are generally more capable of assessing the credibility of news content, particularly when they engage with fact-checking practices on a sustained basis. Repeated exposure to such practices has been shown to enhance the ability to identify misinformation, even in content that extends beyond their initial learning context (Bowles et al., 2025).

Crucially, the presence of evidence-based reasoning within fact-checks further supports evaluative accuracy. Such fact-checks enhance understanding of political statements and reduce the persuasive impact of falsehoods, especially in emotionally charged or negative political advertisements. Fact-checking functions as a cognitive anchor during periods of informational saturation (Wintersieck et al., 2021). Additionally, fact-checking improves belief accuracy even in individuals holding firmly entrenched false beliefs, underscoring its resilience and practical efficacy across diverse cognitive contexts (Carnahan, Bergan, 2022).

As a result, it is reasonable to believe that well-informed individuals, especially experts like information scientists, are better equipped to assess news content objectively. However, upon closer examination, the situation proves to be more complex. Research shows that although fact-checking education can significantly improve how people evaluate information, this improvement is not consistent for everyone and does not fully protect against deeper personal and ideological biases.

A good example of this can be found in a study that highlights the fact that the success of fact-checking largely depends on how the message is presented, particularly who the source is believed to be. If the source is seen as politically neutral, people are more likely to trust the information. However, if the source appears to be politically biased, people are more likely to dismiss it. Most

people tend to judge the credibility of news through the lens of their existing political views, particularly in countries where media outlets are privately owned and not generally seen as neutral. This is a clear example of motivated reasoning, a mental process in which people interpret information in a way that supports what they already believe (Asano et al., 2021). Additionally, fact-checking messages labeled as originating from artificial intelligence systems or crowdsourced platforms are more effective in reducing partisan bias compared to those attributed to human experts. This suggests that not only does the fact-checking method matter, but so does its perceived origin, revealing the complex interplay between epistemological trust and identity-driven perception (Chung et al., 2024).

Echoing this perspective, other researchers find that fact-checking labels alone have limited impact on how users perceive the credibility of news, particularly when the content is politically charged (Oeldorf-Hirsch et al., 2024). Presenting a confirmed or disputed label does not significantly alter evaluative outcomes, unless the label aligns with the user's existing political orientation. This suggests that knowledge of fact-checking practices does not automatically override the ideological filters through which content is interpreted. Further empirical support demonstrates that political ideology, emotional disposition, and trust in media institutions continue to be significant news determinants in evaluation, even among methodologically trained individuals (Friggeri et al., 2014; Lazer et al., 2018; Vosoughi et al., 2018). A particularly telling finding is that partisans perceive neutral coverage from politically opposed outlets as biased, even after accounting for their prior beliefs about the outlet and the content (Lo Iacono, Daniel Dores Cruz, 2022). This demonstrates that personal bias significantly distorts the evaluative process, regardless of the level of training.

Additional studies demonstrate a divide in trust between digital-native and traditional media outlets, driven in part by structural changes in media business models and their perceived editorial transparency (Arianto et al., 2019; Horowitz, Lowe, 2020). Participants tended to favor digital outlets for their immediacy and peer-correction mechanisms, while others preferred traditional outlets based on institutional legacy (Tandoc, Maitra, 2017). These patterns reveal that media consumption is shaped not only by ideological affinity but also by the institutional framing of the source, rather than solely by factual content.

This is consistent with second-level agenda-setting theory (McCombs, Shaw, 1972), which explains how media not only influence what people think about, but also how they think about it. Participants in these studies often rated outlets that shared their worldview more favorably, even when the factual accuracy of content was equal or inferior. In this context, confirmation bias was evident even among trained individuals, underscoring the deep-rooted nature of ideological filtering.

The role of emotionally evocative content is another critical factor. Emotionally charged narratives, especially those framed around crisis, betrayal, or fear, can override essential mechanisms of reasoning (Mohan, Chinnasamy, 2024; Pennycook, Rand, 2019). These emotionally saturated messages deepen cognitive blind spots, polarize interpretation, and impair rational judgment, and this point is reinforced by other researchers showing that even trained professionals are vulnerable to subconscious leanings, particularly when evaluating emotionally or ideologically charged content (Lewandowsky et al., 2012; Pennycook, Rand, 2021).

Well-informed individuals can, under certain conditions, evaluate news content more effectively, particularly when they are familiar with structured practices such as lateral reading. College students who received explicit instruction in lateral reading through the Digital Polarization Initiative curriculum showed measurable improvements in their ability to assess the trustworthiness of online information (Brodsky et. al., 2021). This suggests that fact-checking education can cultivate transferable skills, particularly when it incorporates analytical strategies grounded in critical reasoning and verification across multiple sources. However, such gains are not universally applicable or automatically activated. Even the conceptual frameworks and metaphors that underpin fact-checking strategies can carry ideological baggage themselves. The very language used to define misinformation shapes what is seen as problematic, how it is recognized, and what responses are considered legitimate (Eadon, Wood, 2025). This means that even a well-informed evaluator operates within a preconstructed ideational boundary, often without being aware of it.

Researchers have found that while training helps mitigate biases, it does not eliminate them. Interestingly, some studies suggest that well-informed individuals may appear less influenced by their biases than previously assumed; however, even then, this apparent resilience is conditional (Masood,

Tuzov, 2024; Rodrigo-Ginés et al., 2024). For instance, personal judgment remains relatively accurate only when individuals actively consult diverse or independent sources (Pachur, 2024).

Another critical factor is bounded rationality, the tendency of individuals to rely on heuristics or cognitive shortcuts rather than formal reasoning processes. Even well-informed individuals often depend on how easily they can process and reason through information, not on whether the content has undergone formal verification (Yang, 2022). Thus, unless information is presented in a cognitively accessible way, it may still be dismissed or misunderstood.

Exposure to dominant frames across trusted platforms continues to exert a systemic influence. Even informed individuals are susceptible to repeated messaging and salient omissions in public discourse, regardless of their training (Kilgo, 2021). Algorithmic content delivery, social group homophily, and confirmation bias reinforce existing preferences and encourage ideological insulation (Modi et. al., 2024).

The emotional and political entanglement of bias perceptions is also addressed by other researchers who show that even evaluations based on structural awareness can be skewed by personal ideology or identity-based affiliation (Gravesteijn et al., 2014). Furthermore, visual interventions designed to counter ideological bias consistently fail to override the effect of political alignment on perceived credibility (Spinde et al., 2022).

The Greek media ecosystem offers a clear case study of how structural conditions reinforce skepticism, even among well-informed audiences. Greek media are shaped by political affiliations, economic dependencies, and editorial control linked to ownership structures, all of which erode public trust (Serafini, Zagni, 2023). Participants in relevant studies frequently pointed to sponsored journalism or perceived political bias, even in factually accurate reporting. These tendencies align with agenda-setting theories (McCombs, Shaw, 1972), where ownership dynamics guide coverage priorities and suppress dissenting views. As a result, articles from ideologically opposed outlets were often dismissed. At the same time, those from sympathetic media were overvalued despite flaws, highlighting once again how critical thinking alone cannot overcome entrenched bias.

The utility of *MBFC of 2022* as a fact-checking framework is validated across the literature, but its limitations are also acknowledged. Its subjective methodology raises concerns about consistency and replicability. Still, it remains a powerful tool for cultivating fact-checking literacy, which significantly enhances the objectivity of news assessment, even if it doesn't eliminate bias. Addressing the enduring role of personal bias requires not only cognitive awareness, but also collaborative verification strategies and structural changes in how information is presented and consumed (Vinhas, Bastos, 2021).

Lastly, even expert evaluations are vulnerable to human error (D'Alonzo, Tegmark, 2022). Researchers advocate for automated, data-driven systems over manual, human-led assessments, emphasizing their greater resistance to subjective influence. Supporting this view, other research points out that the need to anonymize speaker identity for coders and rely on data over judgment suggests that even experts are not exempt from bias, a conclusion with profound implications for the future of reliable media evaluation (Kim et al., 2022).

In an era dominated by misinformation and digital saturation, developing robust media evaluation skills is more vital than ever. In summary, research reveals that structured fact-checking training, utilizing methodologies such as Caulfield's approach and *MBFC of 2022*, enhances evaluative accuracy, improves pattern recognition, and reduces susceptibility to manipulative content. However, persistent ideological bias, emotional framing, and trust issues surrounding source neutrality often limit the full impact of these interventions. While tools like *MBFC of 2022* and strategies such as lateral reading offer measurable benefits, their effectiveness is conditional, influenced by factors like political alignment, algorithmic exposure, and users' identity-driven biases. Moreover, even trained individuals rely on cognitive shortcuts and remain vulnerable to emotionally charged narratives. Thus, although structured evaluation frameworks significantly improve misinformation detection, their success depends on ongoing practice, diverse information exposure, and potentially, the integration of automated systems to counteract human subjectivity and ideological insulation. To this end, it is interesting to see what the results of the present research reveal.

4. Results

The primary ideological leaning for each of the 8 anonymous faculty participants (Ppt.) was determined based on the category with the highest percentage of responses to questions 2 through

14, which were adapted from the *Pew Research Center's* political orientation survey (see Annex), and is summarized as follows (Table 1):

Table 1. Political orientation of each anonymous participant

Ppt.	Far left, %	Left, %	Center left,%	Center, %	Center right, %	Right, %	Far right, %	Main political leaning
A1	8	31	15	15	23	0	8	left
A2	15	31	15	8	15	8	8	left
A3	0	23	8	23	15	23	8	centrist/mix
A4	23	39	15	15	8	0	0	left
A5	15	46	15	8	8	0	8	left
A6	23	30	15	8	8	8	8	left
A7	31	46	15	0	8	0	0	strongly left
A8	0	15	15	8	15	39	8	right

The 13 responses from each of the 8 anonymous teaching members of the Department of Archival, Library, and Information Studies at the University of West Attica, totaling 104 answers to 13 closed questions (see questions 2-14 in Annex), indicate that their horizontal political profile can be described as follows: of the 8 participants, 5 (A1, A2, A4, A5, and A6) were classified as left-leaning, while 1 participant (A7) demonstrated a strongly left-leaning orientation, with particularly high proportions of responses in both the left (46 %) and far-left (31 %) categories. Participant A3 exhibited a balanced distribution across the political spectrum, with equal percentages (23 %) in the left, center, and right categories, and was therefore classified as centrist or ideologically mixed. In contrast, participant A8 displayed a clear right-leaning orientation, with the highest share of responses (39 %) aligning with the right category. Overall, the distribution of ideological leanings among the participants included 5 left-leaning, 1 strongly left-leaning, 1 centrist/mix, and 1 right-leaning individual.

In more detail, participant A1's responses to questions 2 through 14 indicate a range of political orientations, with 31 % of answers aligning with a left-leaning position, the highest proportion observed. This is followed by 23 % of responses reflecting a center-right orientation, and 15 % each corresponding to center and center-left positions. Although the distribution suggests some ideological diversity, particularly around the political center, the predominance of left-oriented responses suggests that Participant A1's overall political leaning can be characterized as left-leaning.

Participant A2's responses to questions 2 through 14 reveal a varied political profile, with 31 % of answers indicating a left-leaning orientation, the most prominent category. Additional responses were evenly distributed among far-left (15 %), center-left (15 %), and center-right (15 %), with smaller shares attributed to center (8 %), right (8 %), and far-right (8 %). Despite the presence of ideological diversity, particularly around moderate and adjacent positions, the predominance of left-aligned responses suggests that Participant A2's overall political leaning can be classified as left-leaning.

Participant A3's responses to questions 2 through 14 indicate a relatively balanced political orientation. The highest proportions of responses, 23 % each, align with the left, center, and right categories, while smaller percentages fall into center-left (8 %), center-right (15 %), and far-right (8 %) categories. Notably, there are no responses associated with the far-left. This distribution suggests that Participant A3 does not exhibit a clear ideological bias toward either end of the political spectrum. Instead, the pattern reflects a centrist or ideologically mixed political leaning.

Participant A4's responses to questions 2 through 14 strongly indicate a left-leaning political orientation. A significant majority of the responses, 39 % and 23 %, align with left and far-left positions, respectively, while an additional 15 % corresponds to center-left. Responses indicating centrist or center-right views account for a combined 23 %, with no responses falling into the right

or far-right categories. This distribution reveals a pronounced tendency toward progressive or leftist views. Therefore, Participant A4's overall political leaning can be characterized as left-leaning, with a notable inclination toward the more progressive end of the spectrum.

Participant A5's responses to questions 2 through 14 indicate a distinctly left-leaning political orientation. Nearly half (46 %) of the responses align with a left position, while an additional 30 % fall within far-left and center-left categories. In contrast, only a small fraction of responses corresponds to centrist (8 %), center-right (8 %), and far-right (8 %) perspectives, with no representation on the right. This distribution demonstrates a clear ideological inclination toward progressive or left-aligned viewpoints. Accordingly, Participant A5's overall political leaning can be characterized as left-leaning, with strong consistency across responses.

Participant A6's responses to questions 2 through 14 suggest a predominantly left-oriented political stance. A combined 68 % of responses fall into the far-left (23 %), left (30 %), and center-left (15 %) categories, indicating a strong alignment with progressive or left-leaning views. The remaining responses are evenly distributed across center, center-right, right, and far-right positions, each accounting for only 8 %. Despite this minor ideological variation, the clear majority of responses reflect a consistent preference for left-leaning perspectives. Therefore, Participant A6's overall political leaning can be classified as left-leaning.

Participant A7's responses to questions 2 through 14 reveal a strong and consistent left-oriented political stance. A significant majority of responses, 31 % far-left, 46 % left, and 15 % center-left, amount to 92 % of the total, clearly indicating a progressive or left-leaning ideological profile. With only 8 % of responses falling into the center-right category and none aligning with centrist, right, or far-right positions, the data shows minimal ideological diversity. Therefore, Participant A7's overall political leaning can be confidently characterized as strongly left-leaning.

Participant A8's responses to questions 2 through 14 indicate a political orientation that leans predominantly to the right. The highest proportion of responses (39 %) align with a right-leaning position, supported by an additional 15 % in center-right and 8 % in far-right categories. While 15 % of responses fall within both the left and center-left, and 8 % reflect centrist views, the overall distribution is clearly weighted toward conservative perspectives. Therefore, Participant A8's political leaning can be classified as right-leaning.

In summary, most anonymous respondents exhibit a political profile with left-wing bias.

The following figures and data present detailed findings from evaluating each of the 6 anonymized mass media outlets, mapped back to their identified channels at the last phase of the experiment (see Annex questions 16 through 50 adapted from Media Bias/Fact Check, 2022, and questions 51, 52, 53, 54, 55, 56 added by the researchers. Note that questions 15, 21, 27, 33, 39, and 45 are instructions for the participants.

In questions 16, 17, and 18, 87.5 % of respondents considered the news presented by Mass Media 1 to be politically biased, while 12.5 % viewed it as neutral (Figure 2).

Question 19 (was the news item from Media Outlet 1 broadcast by a media outlet that supports a specific political ideology?) focused on the outlet's political orientation. In this case, 62.5 % perceived bias: 25 % identified a right-wing leaning, 25 % center-left, and 12.5 % left-wing. The remaining 37.5 % viewed the outlet as politically neutral.

During the blind evaluation (question 20: based on the news item you heard from Media Outlet 1, how would you generally characterize the political orientation of the outlet?), where the outlet's identity was unknown, responses were divided: 37.5 % considered it neutral, another 37.5 % identified it as center-left, and 25 % as right-wing. When the outlet was later revealed as *MEGA* (question 53), the assessment shifted to the right: 37.5 % described it as center-right, another 37.5 % as right-wing, and 25 % as center-left.

In summary, Mass Media 1 (*MEGA*) was perceived more moderately in the blind evaluation, with only 25 % of anonymous respondents classifying it as right-wing. However, it was viewed as leaning more decisively to the right (75 %) in the known evaluation. This suggests that brand recognition influenced perceptions, increasing the tendency to associate *MEGA* with a right-leaning bias.
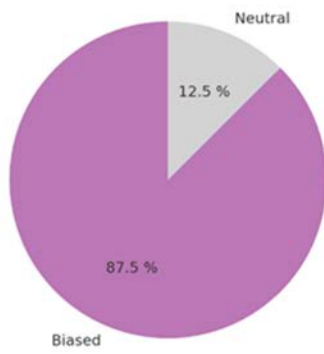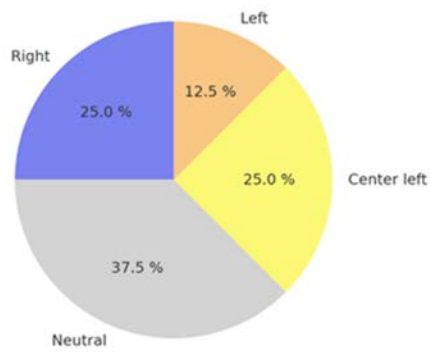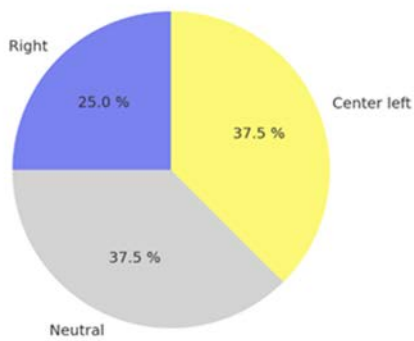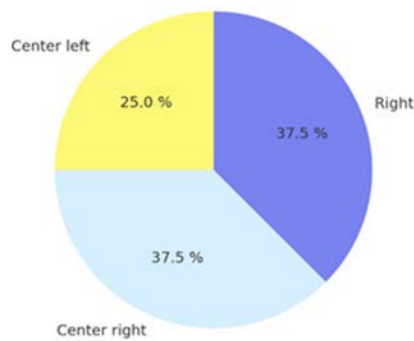
Fig. 2. Mass Media 1
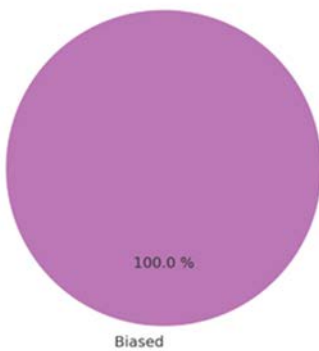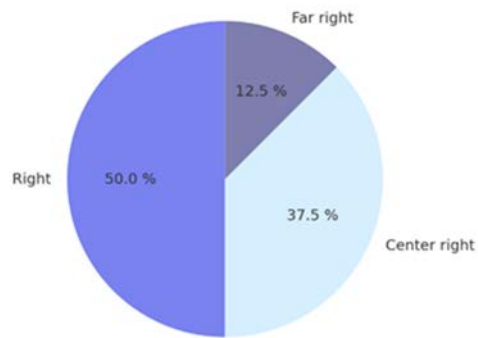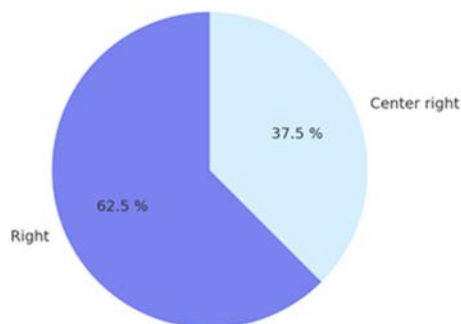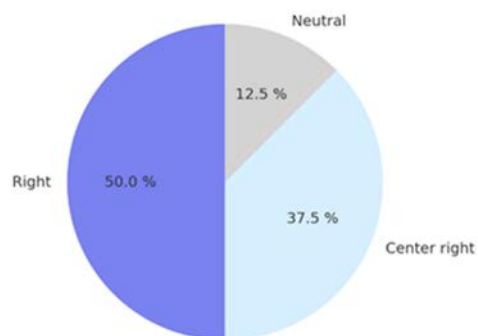
Fig. 3. Mass Media 2

According to all respondents (100 %) in questions 22, 23, and 24 (see Annex), the news item aired by Mass Media 2 was perceived as politically biased (Figure 3).

In question 25, which explicitly asked about the outlet's political orientation, the same unanimous judgment of bias was observed. Among the participants, 50 % described Mass Media 2 as right-wing, 37.5 % as center-right, and 12.5 % as far-right. None considered it politically neutral.

When the outlet's identity was concealed (blind evaluation, question 26), 62.5 % of participants identified its stance as right-wing, and 37.5 % as center-right. In the corresponding known evaluation (question 51), where the outlet was revealed as *ERT*, 50 % characterized it as right-wing, 37.5 % as center-right, and 12.5 % as neutral.

In summary, the 8 anonymous, predominantly left-leaning respondents unanimously viewed Mass Media 2 (*ERT*) as politically biased, primarily leaning toward the right-wing spectrum, both in blind and non-blind evaluations.
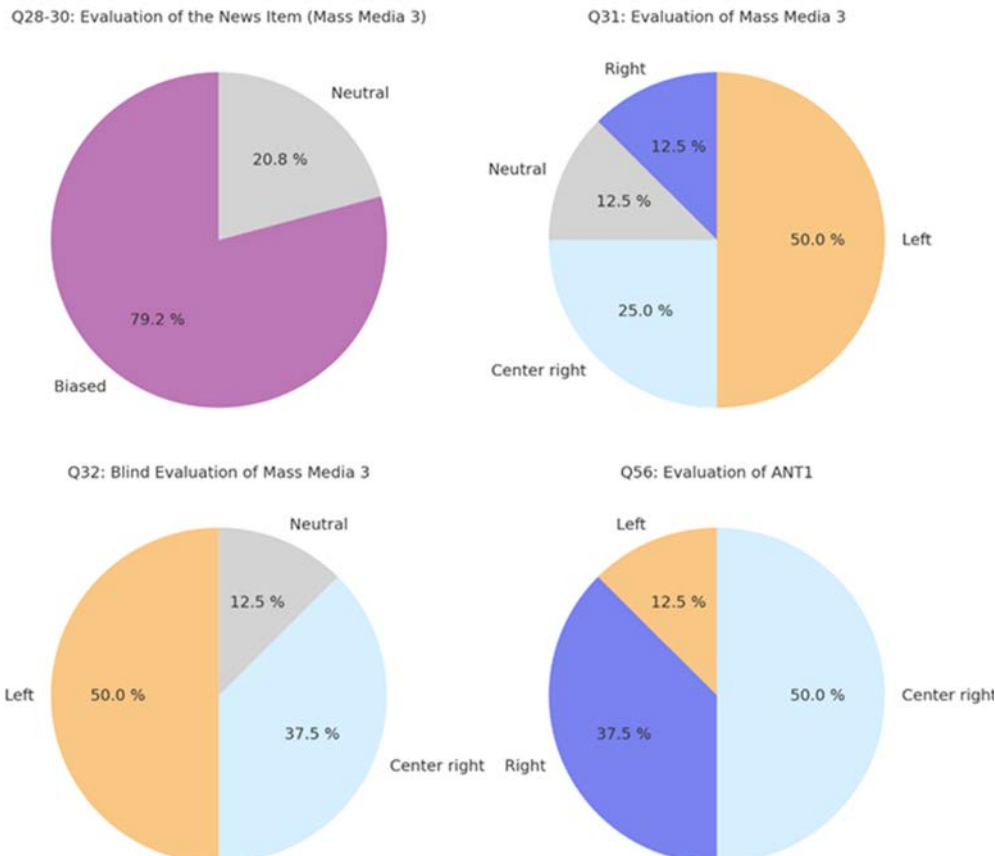
Fig. 4. Mass Media 3

In questions 28, 29, and 30 (see Annex), 79.2 % of respondents described the news item aired by Mass Media 3 as politically biased, while 20.8 % considered it neutral (Figure 4).

In question 31, which asked about the political orientation of the outlet, 87.5 % perceived a bias: 12.5 % identified it as right-wing, 25 % as center-right, 50 % as left-wing, and 12.5 % as neutral.

During the blind evaluation (question 32), where the outlet's identity was concealed, 50 % of participants classified it as left-wing, 37.5 % as center-right, and 12.5 % as neutral. The pattern shifted when the outlet was revealed as *ANT1* (question 56): 50 % described it as center-right, 37.5 % as right-wing, and only 12.5 % as left-wing.

In summary, Mass Media 3 (*ANT1*) was perceived as left-leaning in the blind evaluation but shifted to a predominantly right-wing classification in the known evaluation. According to the 8 anonymous, mostly left-leaning participants, the outlet demonstrated an overall bias rate of 87.5 %, aligning with the broader finding that 79.2 % of participants judged its news content as politically biased.

In questions 34, 35, and 36 (see Annex), 87.5 % of respondents characterized the news presented by Mass Media 4 as politically biased, while 12.5 % considered it neutral (Figure 5).

In question 37, which focused on identifying the outlet's political leaning, 87.5 % again perceived a political bias. Specifically, 37.5 % labeled it as right-wing, 25 % as center-right, another 12.5 % also as center-right, 12.5 % as far-left, and 12.5 % believed the outlet had no specific ideological alignment.

During the blind evaluation (question 38), where the outlet's identity was not disclosed, opinions varied: 50 % described it as right-wing, 12.5 % as center-right, 12.5 % as neutral, 12.5 % as center-left, and 12.5 % as far-left. When the outlet was revealed as *STAR* in the known evaluation (question 55), perceptions became more concentrated, with 75 % identifying it as center-right and 25 % as right-wing.
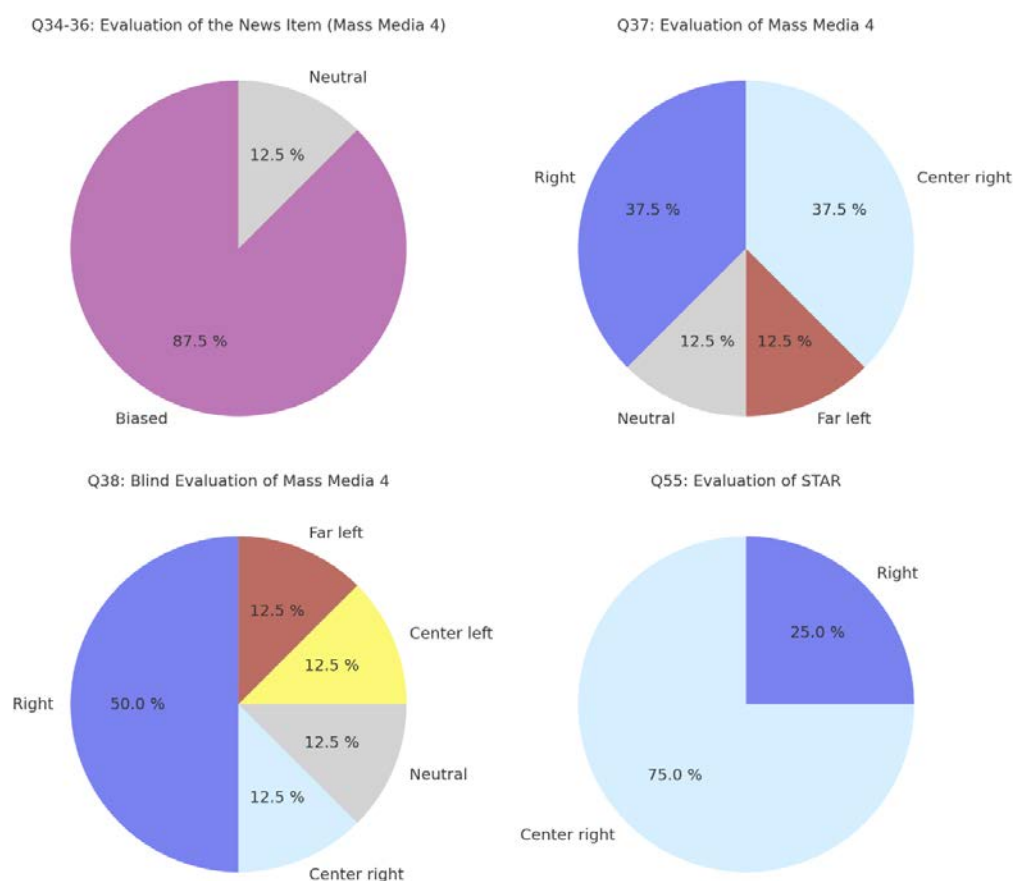

Fig. 5. Mass Media 4

In summary, Mass Media 4 was primarily perceived as politically biased across all evaluations. While responses in the blind evaluation varied across the political spectrum, the named evaluation (*STAR*) produced a strong consensus toward a center-right alignment. Overall, 87.5 % of participants considered the outlet's news content biased, which indicates a clear perception of political leaning, regardless of whether the outlet's identity was known.

In questions 40, 41, and 42 (see Annex), 87.5 % of participants considered the news aired by Mass Media 5 politically biased, while 12.5 % perceived it as neutral (Figure 6).

Question 43 further explored the outlet's political orientation. Among respondents, 87.5 % identified a political bias: 37.5 % toward the right, 37.5 % toward the center-right, and 12.5 % toward the left. Only 12.5 % saw no affiliation with any political ideology.

In the blind evaluation (question 44), where the identity of the outlet was concealed, 50 % characterized Mass Media 5 as right-wing, 25 % as center-right, 12.5 % as neutral, and 12.5 % as left-wing. When the outlet was later revealed as *OPEN* (question 54), responses were evenly split: 25 % each identified it as left-wing, center-left, center-right, and right-wing.
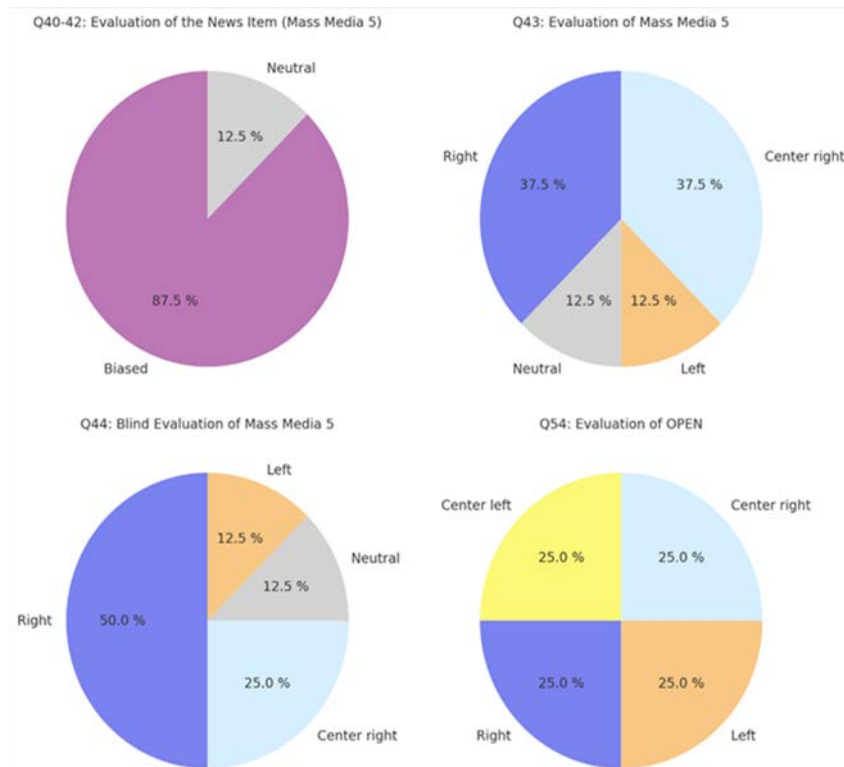
Fig. 6. Mass Media 5

In summary, Mass Media 5 (*OPEN*) was considered politically biased by most respondents (87.5 %) and was predominantly perceived as leaning toward the right-wing spectrum in the blind evaluation; however, opinions diversified once the outlet's identity was revealed.
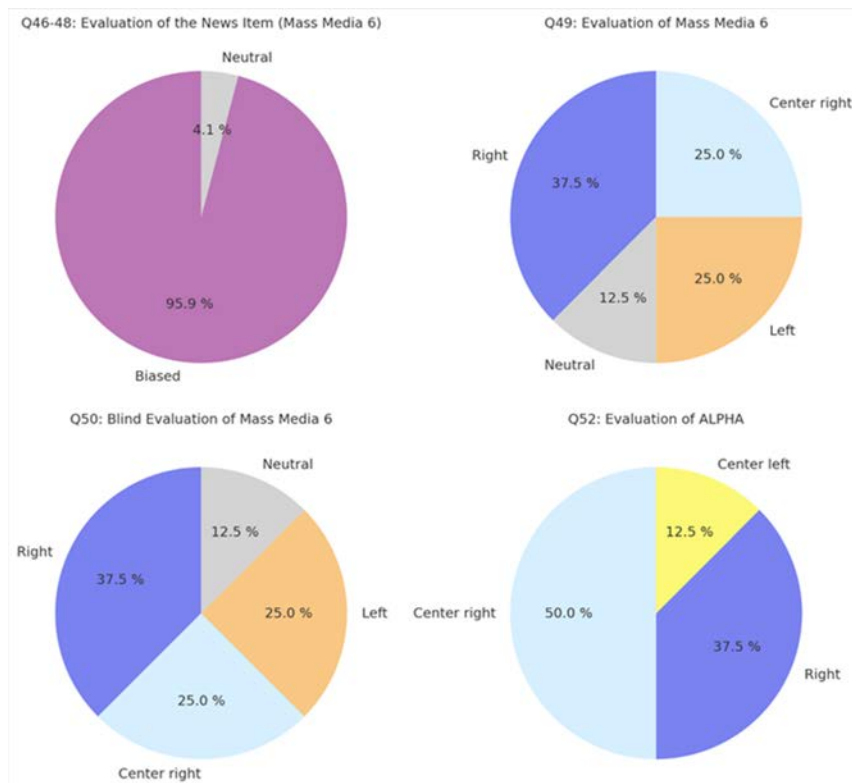

Fig. 7. Mass Media 6

In questions 46, 47, and 48 (see Annex), 95.9 % of participants described the news presented by Mass Media 6 as politically biased, while only 4.1 % considered it neutral (Figure 7).

In question 49, which asked about the outlet's political orientation, 87.5 % of respondents perceived a bias: 37.5 % identified it as right-wing, 25 % as center-right, and 25 % as left-wing. The remaining 12.5 % did not associate it with any specific political direction.

During the blind evaluation (question 50), where the outlet's identity was concealed, 37.5 % characterized Mass Media 6 as right-wing, 25 % as center-right, 25 % as left-wing, and 12.5 % as neutral. When the outlet was later revealed as *ALPHA* (question 52), 50 % identified it as center-right, 37.5 % as right-wing, and 12.5 % as center-left.

In summary, the 8 anonymous, predominantly left-leaning respondents consistently viewed Mass Media 6 (*ALPHA*) as politically biased, primarily leaning toward the right spectrum. Overall, the perception of bias in its news content reached 95.9 %.

Each media outlet (*MEGA, ERT, ANT1, STAR, OPEN, ALPHA*) features two side-by-side bars. The left bar represents blind evaluations (outlet identity unknown), while the right bar represents named evaluations (outlet identity revealed). *MEGA*, *ANT1*, and *ALPHA* exhibit reduced neutrality and increased right-leaning perceptions when the outlet name is disclosed. *ERT* maintains a consistently strong right-wing perception in both phases. *STAR* and *OPEN* demonstrate a consolidation of responses toward the center-right and right during the known phase. *OPEN* is notable for exhibiting more ideological diversity in the blind phase, which levels out across the spectrum when the outlet is known (Figure 8).
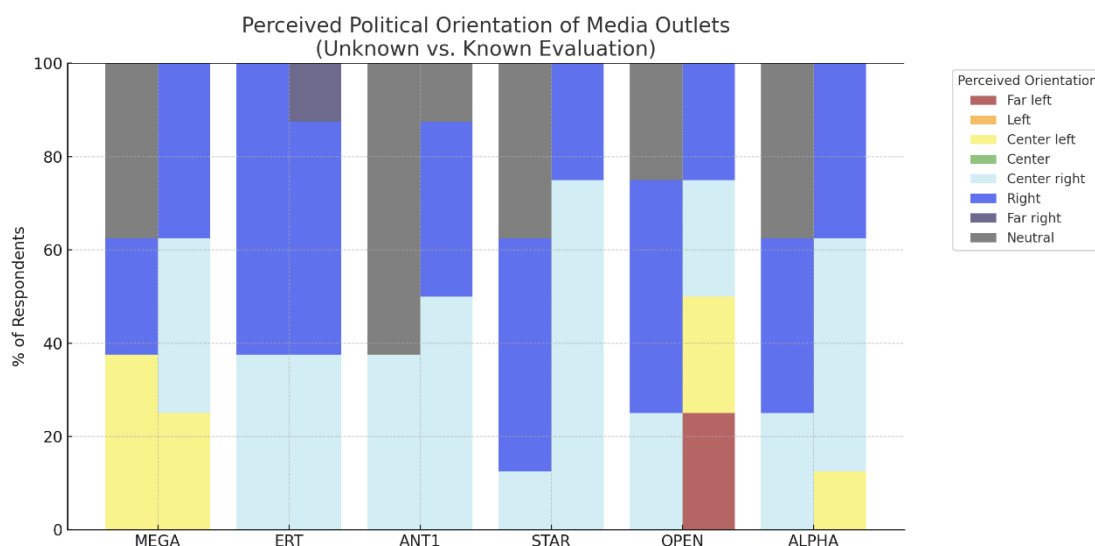
Fig. 8. Perceived Political Orientation of Media Outlets (Unknown vs. Known Evaluation

Across all 6 media outlets, the perception of political bias in news reporting was notably high, ranging from 79.2 % to 100 %. Blind evaluations typically produced more politically diverse responses, while known evaluations tended to shift perceptions, especially toward the right, for specific outlets. The left-leaning orientation of most respondents may have contributed to a more critical view of outlets that align with center-right or right-wing positions. Mass Media 3 (*ANT1*) stood out as the least biased in blind conditions, while Mass Media 2 (*ERT*) was judged as the most uniformly biased.

5. Conclusion

In an age marked by digital saturation and widespread misinformation, developing strong media evaluation skills is more critical than ever. Existing research demonstrates that structured fact-checking methods such as Caulfield's lateral reading approach and tools like Media Bias/Fact Check, can improve people's accuracy in evaluating information, enhance their ability to detect patterns of bias, and reduce their susceptibility to manipulative content. However, these benefits are often tempered by persistent ideological bias, emotional framing, and skepticism about the neutrality of information sources.

While tools like *MBFC of 2022* and strategies like lateral reading offer measurable value, their effectiveness is influenced by factors such as political alignment, algorithmic exposure, and personal identity. Even trained individuals frequently rely on cognitive shortcuts and remain vulnerable to emotionally charged narratives. These challenges highlight the difficulty of achieving entirely objective media assessments, even within structured evaluation frameworks.

The present study supports and extends these findings. Participants, who mainly were left-leaning, perceived all assessed media outlets as biased. When the identities of the outlets were disclosed, participants were more likely to rate them as having a more substantial right-wing bias. Although the use of the *MBFC of 2022* tool improved evaluative consistency among participants, their political views still influenced their judgments. This outcome highlights the persistent influence of confirmation bias, even among individuals who have received some form of media literacy training and underscores the complexity of promoting impartial evaluations in politically polarized environments.

Despite its limited scope, the research provides valuable insights into how political bias in the media is perceived and evaluated. At the same time, it is important to recognize the study's limitations. Acknowledging these constraints helps clarify the scope of the findings and identifies areas where future research is needed. This was an exploratory, controlled pilot study, intended more as a starting point for discussion and reflection than as a source of definitive conclusions.

Like any emerging methodology, the evaluation framework introduced here, including the use of *MBFC of 2022*, requires adaptation to *MBFC of 2025*, further testing and validation. Its long-term value will depend on how reliably it performs across different populations and settings. One significant limitation of this study is the small and relatively homogeneous sample. While suitable for a pilot design, the limited diversity among participants restricts the broad applicability of the findings. Future research should engage larger, more diverse samples, that represent a wider range of political perspectives and backgrounds, to understand better how perceived media bias varies across the ideological spectrum.

Additionally, while there is a growing body of literature on media perception and bias detection, few studies have experimentally tested MBFC-style evaluation approaches. This research, therefore, represents an initial step in what should become a broader and more comprehensive field of study. Future work could refine the methodology, examine its consistency over time, and explore how it might be effectively integrated into educational programs or journalistic practice.

In summary, although modest in scale, this study marks a meaningful entry point for the empirical examination of structured media bias evaluation. It highlights both the promise and the challenges of improving critical media literacy in a polarized information environment. By encouraging further investigation and refinement, it contributes to the ongoing effort to promote more informed, critical, and resilient media consumers.

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Appendix

Full Survey Questions

Q#	Survey Question
1 – (Instruction)	I acknowledge that I have been informed about the purpose of this anonymous survey and voluntarily agree to participate.
2 – (Adapted from Pew Research Center, 2021)	Please select the statement that best reflects your viewpoint: ▪ I support a government that emphasizes a strengthened public sector and expanded social services. (*Note for researchers: In Greece this viewpoint is mainly left-leaning*). ▪ I support a government that prioritizes a strengthened private sector and the expansion of private services. (*Note for researchers: In Greece this viewpoint is mainly right-leaning*). ▪ I support a government that pursues a balanced approach to the development of both public and private sectors (*Note for researchers: In Greece this viewpoint is mainly center-leaning*).
3 – (Adapted from Pew Research Center, 2021)	Please select the statement that best reflects your viewpoint: ▪ The openness of our country to people from around the world is a fundamental aspect of our national identity (*Note for researchers: In Greece this viewpoint is mainly left-leaning, center-left leaning and to a lesser extent center-leaning*). ▪ Excessive openness to people from around the world may distort our national identity (*Note for researchers: In Greece this viewpoint is mainly right-leaning and far-right-leaning*).
4 – (Adapted from Pew Research Center, 2021)	Please select the statement that best reflects your viewpoint: ▪ In general, experts who have studied a subject for many years are usually better at making policy decisions on that subject than other people (*Note for researchers: In Greece this viewpoint is mainly right-leaning*). ▪ In general, experts who have studied a subject for many years are usually worse at making political decisions about that issue than other people (*Note for researchers: In Greece this viewpoint may resonate more with populist or anti-elitist sentiments, which can appear on both the far-left and far-right.*). ▪ In general, experts who have studied a subject for many years are neither better nor worse at making political decisions about that issue than other people (*Note for researchers: In Greece this viewpoint is mainly center-leaning*).
5 – (Adapted from Pew Research Center, 2021)	Please select the statement that best reflects your viewpoint: ▪ Our country's increasing engagement in international trade is likely beneficial, as it promotes business competition and helps lower the prices of goods and services (*Note for researchers: In Greece this viewpoint is mainly right-leaning*).

Q#	Survey Question
	▪ Our country's increasing engagement in international trade is likely detrimental, as it intensifies business competition, which may lead to job losses—particularly among smaller firms – and/or lower wages in certain employment sectors (*Note for researchers: In Greece this viewpoint is mainly left-leaning*).
6 – (Adapted from Pew Research Center, 2021)	To what extent do you believe additional efforts are needed to ensure equal rights for all individuals residing in our country, regardless of their racial or ethnic background? ▪ A great deal (*Note for researchers: In Greece this viewpoint is mainly left-leaning*). ▪ A little (*Note for researchers: In Greece this viewpoint is mainly center-leaning and some right-leaning*). ▪ None (*Note for researchers: In Greece this viewpoint is mainly far right-leaning*).
7 – (Adapted from Pew Research Center, 2021)	Please select the statement that best reflects your viewpoint: ▪ Business groups generally earn excessively high profits. (*Note for researchers: In Greece this viewpoint is mainly left-leaning*). ▪ Most business groups earn profits that are fair and reasonable. (*Note for researchers: In Greece this viewpoint is mainly right-leaning*).
8 – (Adapted from Pew Research Center, 2021)	Please select the statement that best reflects your viewpoint: ▪ Our country, as a cradle of civilization, is the greatest nation in the world. (*Note for researchers: In Greece this viewpoint is mainly far right-leaning*). ▪ Our country is among the best in the world. (*Note for researchers: In Greece this viewpoint is mainly center-leaning and/or right-leaning*). ▪ There are countries in the world that are better than ours. (*Note for researchers: In Greece this viewpoint is mainly left-leaning*).
9 – (Adapted from Pew Research Center, 2021)	Please select the statement that best reflects your viewpoint: ▪ It is a major problem that people say things that are deeply offensive to others (e.g., regarding their country of origin). (*Note for researchers: In Greece this viewpoint is mainly left-leaning*). ▪ People sometimes say offensive things to others, but this is a minor problem. (*Note for researchers: In Greece this viewpoint is mainly right-leaning*). ▪ Although people may say offensive things to others, this is not a problem. (*Note for researchers: In Greece this viewpoint is mainly far right-leaning*).
10 – (Adapted from Pew Research Center, 2021)	Please select the statement that best reflects your viewpoint: ▪ I usually vote for a political party regardless of the personality of its leader. (*Note for researchers: In Greece this viewpoint is mainly left-leaning or/and far left-leaning*). ▪ I usually vote for a political party based on the personality of its leader. (*Note for researchers: In Greece this viewpoint is mainly center-leaning or/and right-leaning*).
11 – (Adapted from Pew Research Center, 2021)	In general, to what extent do you believe Greeks benefit from societal advantages that are not available to foreigners? ▪ Very much (*Note for researchers: In Greece this viewpoint is mainly far-right leaning*). ▪ Quite a lot (*Note for researchers: In Greece this viewpoint is mainly right-leaning and center-leaning*). ▪ Not very much (*Note for researchers: In Greece this viewpoint is mainly left-leaning*).
12 – (Adapted from Pew Research Center,	Overall, how would you assess the length of sentences given to individuals convicted of crimes in this country?

Q#	Survey Question
2021)	▪ They serve excessively long sentences. (*Note for researchers: In Greece this viewpoint is mainly left-leaning*). ▪ They serve sentences that are too short. (*Note for researchers: In Greece this viewpoint is mainly right-leaning*). ▪ They receive an appropriate length of sentence. *(Note for researchers: In Greece this viewpoint is mainly center-leaning*).
13 – (Adapted from Pew Research Center, 2021)	Please select the statement that best reflects your viewpoint: ▪ The church should be separate from the state. (*Note for researchers: In Greece this viewpoint is mainly left-leaning*). ▪ The state and the church should be united. (*Note for researchers: In Greece this viewpoint is mainly right-leaning*).
14 – (Adapted from Pew Research Center, 2021)	Please select the statement that best reflects your viewpoint: ▪ Our country should maintain or increase spending on national defense equipment. *(Note for researchers: In Greece this viewpoint is mainly right-leaning, center-right and center-leaning*). ▪ Our country should reduce spending on national defense equipment. (*Note for researchers: In Greece this viewpoint is mainly far-left-leaning*).
15 – (Instruction-News Item from Media Outlet 1) ***Note***: *Questions 21, 27, 33, 39, and 45 are identical to Question 16 and refer to the same news story as presented by **Media Outlets 2**, **3**, **4**, **5**, and **6**, respectively.*	(Blind question) Please listen to a political news story as it was presented by six major Greek media outlets. Then, evaluate the news item from Media Outlet 1 based on the questions that follow. I have listened to the news item from Media Outlet 1.
16 – (Adapted from Media Bias/Fact Check, 2022) ***Note***: *Questions 22, 28, 34, 40, and 46 are identical to Question 16 and refer to the same news story as presented by **Media Outlets 2**, **3**, **4**, **5**, and **6**, respectively.*	(Blind question) The news item from Media Outlet 1 uses emotionally charged language to evoke feelings and influence the listener, and its headline does not align well with the story. Please rate it on a scale from 1 to 10 according to the following criteria: 1–2: Does not use emotionally charged language to influence the listener, and the headline fits the story very well or fairly well. 2–5: Likely uses emotionally charged language to influence the listener in favor of the **Center-Left** or **Center-Right** *(Please select only one.).* 5–8: Likely uses emotionally charged language to influence the listener in favor of the **Left** or the **Right** *(Please select only one.).* 8–10: Likely uses emotionally charged language to influence the listener in favor of the **Far-Left** or **Far-Right** *(Please select only one.).*
17 – (Adapted from Media Bias/Fact Check, 2022) ***Note***: *Questions 23, 29, 35, 41, and 47 are identical to Question 17 and refer to the same news story as presented by **Media Outlets 2**, **3**, **4**, **5**, and **6**, respectively.*	(Blind question) The news item from Media Outlet 1 presents well-documented information and supports its claims with credible sources (e.g., by citing other sources). Please rate it on a scale from 1 to 10 based on the following criteria: 1–2: Provides well-documented information and supports its claims with high-quality, reliable sources (e.g., cites multiple independent sources). 2–5: Provides documented information but primarily supports its claims with sources aligned with the **Center-Left** or **Center-Right** *(Please select only one.).* 5–8: Provides documented information but primarily supports its claims with sources aligned with the **Left** or the **Right** *(Please select*

Q#	Survey Question
	only one.). 8–10: Provides documented information but primarily supports its claims with sources aligned with the **Far-Left** or **Far-Right** (*Please select only one.*).
18 – (Adapted from Media Bias/Fact Check, 2022) *Note*: Questions 24, 30, 36, 42, and 48 are identical to Question 18 and refer to the same news story as presented by ***Media Outlets 2***, *3*, *4*, *5*, and *6*, respectively.	(Blind question) Does the news item from Media Outlet 1 present information and viewpoints from multiple perspectives, or mainly from one? Please rate it on a scale from 1 to 10 using the following criteria: 1–2: Presents information and viewpoints from multiple perspectives. 2–5: Primarily presents information and viewpoints from one side, aligned with the **Center-Left** or **Center-Right** (*Please select only one.*). 5–8: Primarily presents information and viewpoints from one side, aligned with the **Left** or the **Right** (*Please select only one.*). 8–10: Primarily presents information and viewpoints from one side, aligned with the **Far-Left** or **Far-Right** (*Please select only one.*).
19 – (Adapted from Media Bias/Fact Check, 2022) *Note*: Questions 25, 31, 37, 43, and 49 are identical to Question 19 and refer to the same news story as presented by ***Media Outlets 2***, *3*, *4*, *5*, and *6*, respectively.	(Blind question) In your opinion, was the news item from Media Outlet 1 broadcast by a media outlet that supports a specific political ideology? Please rate it on a scale from 1 to 10 using the following criteria: 1–2: In my opinion, the news item was presented by a media outlet that does not clearly support a specific political ideology. 2–5: In my opinion, the news item was presented by a media outlet that likely supports the **Center-Left** or **Center-Right** (*Please select only one.*). 5–8: In my opinion, the news item was presented by a media outlet that likely supports the **Left** or the **Right** (*Please select only one.*). 8–10: In my opinion, the news item was presented by a media outlet that likely supports the **Far-Left** or **Far-Right** (*Please select only one.*).
20 – (Adapted from Media Bias/Fact Check, 2022) *Note*: Questions 26, 32, 38, 44, and 50 are identical to Question 20 and refer to the same news story as presented by ***Media Outlets 2***, *3*, *4*, *5*, and *6*, respectively.	(Blind question) Based on the news item you heard from Media Outlet 1, how would you generally characterize the political orientation of the outlet? (*Please select only one.*). - Neutral - Center-Left - Center-Right - Left - Right - Far-Left - Far-Right
51 – (This question was added by the researchers to examine whether the known identity of each media outlet influences participants' perceptions.) *Note*: Questions 52, 53, 54, 55, and 56 are identical to Question 51 but refer to the	In your opinion, does ERT support a specific political ideology? Please select the option that best reflects your view (*Please select only one.*): - In my opinion, it does not clearly support any specific political ideology. - In my opinion, it likely supports the Center-Left. - In my opinion, it likely supports the Center-Right. - In my opinion, it likely supports the Left. - In my opinion, it likely supports the Right. - In my opinion, it likely supports the Far-Left. - In my opinion, it likely supports the Far-Right.

Q#	Survey Question
media outlets ALPHA, MEGA, OPEN, STAR, and ANT1, respectively.	249

Note*: In blind questions*
- ▪ *Unknown Media Outlet 1 was MEGA*
- ▪ *Unknown Media Outlet 2 was ERT*
- ▪ *Unknown Media Outlet 3 was ANT1*
- ▪ *Unknown Media Outlet 4 was STAR*
- ▪ *Unknown Media Outlet 5 was OPEN*
- ▪ *Unknown Media Outlet 6 was ALPHA*

Assessing Fact-Checking Sites and Sentiment Analysis of Misinformation

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Abstract

The rapid dissemination of misinformation in the digital age poses a threat comparable to that of infectious diseases, spreading swiftly through social media platforms and often deceiving users with ease. The virality and persuasive nature of such content amplify its impact, making timely and effective fact-checking crucial. This article analyses the effectiveness of fact-checking sites by evaluating whether they have examined the misinformation. In addition, the study conducts a sentiment analysis of user comments on the original misinformed posts, using an Excel add-in called Meaning Cloud, aiming to assess public agreement with the misinformation as well as the prevalence of positive and negative sentiments. One misinformation from categories like political, health, sports, and general was selected. Out of the four misinformation selected, three of them were all fact-checked by at least four fact-checking sites. In all four of the misinformation, most of the comments are in an agreeing nature. This shows that users believe the misinformation. The political and health misinformed posts' comments have comparatively higher negative sentiment, while the sports and general misinformation posts have comparatively more positive sentiment. The sentiment of the comments of the misinformation depends on the content and the context of the misinformation.

Keywords: misinformation, fake news, social media, sentiment, fact-checked.

1. Introduction

Fake news is the published news that contains fake information to mislead people intentionally (Islam et al., 2020). The other terms associated with fake news are 'misinformation' and 'disinformation'. The definitions of misinformation that were most frequently used were "False and misleading information" and "False and misleading information spread unintentionally." (Altay et al., 2023). On the other hand, disinformation is the false information created with the intention to deceive (Wardle, Derakhshan, 2017). But in many studies, the term 'misinformation' is used as an umbrella term for any type of inaccurate or deceptive information, regardless of its motivation (Altay et al., 2023). The massive production of misinformation in the digital world is a new threat to the current world. The World Economic Forum's Global Risk Report 2024, identifies the most significant risk for the next two years as misinformation and disinformation. Social media has enabled everyone to connect with the world, resulting in an enormous amount of information being produced every minute, making it difficult to evaluate this huge amount of information. Apart from this, people rely on social media platforms for daily news, which again makes people more prone to fake news. The specific features of social media, like algorithms and echo chambers, increase the risk of misinformation. This makes social media a space for the spread of hoaxes, conspiracy theories, and manipulated content (Novotná et al., 2023; Rodríguez-Pérez et al., 2025).

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Fact-checking is the process of routinely publishing evaluations of the veracity of statements made by institutions and public authorities with the specific goal of determining if a claim is true (Walter et al., 2020). Fact-checking journalism, which started at the end of the 20th century, became more popular by the 21st century, joined by new, specialized digital media as well as established media, making verification their journalistic goal (Amazeen, 2019; Rodríguez-Pérez et al., 2025). People usually do not come across fact-checking posts like those of the misinformed posts. Fact-checking sites' familiarity is predicted by a number of factors, including age, gender, education, political interest, political efficacy, liberal ideology, political discourse, and news consumption (Robertson et al., 2020). The effect of fact-checking posts on people is still debatable. Some studies show that fact-checking posts can correct the misinformed beliefs of people (Fridkin et al., 2015; Porter et al., 2018; Wood, Porter, 2019), while some studies say it has very little impact (Lewandowsky et al., 2012; Nyhan, Reifler, 2010).

This study aims to find answers to the research questions:
– RQ1 – To what extent do the fact-checking sites fact-check the misinformation?
– RQ2 – What is the level of belief in misinformation among social media users?
– RQ3 – What is the sentiment in the comments of the misinformed posts by social media users?

Review of Literature
Fake News, Misinformation, Disinformation

Fake news is not a new phenomenon (Digwatch News, 2020). Fake news has existed in the form of rumors and false stories ever since humans lived in groups and power mattered (Burkhardt, 2017). An official record of fake news dates back to the Roman Empire period, when intentional fake news was spread to defame Mark Antony (Kaminska, 2017). Later in the 1430s, with the invention of the printing press by Gutenberg, fake news spread in the form of published printed articles (Soll, 2016). World War I and World War II also witnessed various propaganda being spread (Posetti, Matthews, 2018).

There are several terms related to the term *fake news*, like *misinformation, disinformation, malinformation*, etc. A major difference between misinformation and disinformation is the intention behind its spread. Misinformation is the false information that is not intended to cause harm, while disinformation is false information that is intended to cause harm (Wardle, Derakhshan, 2017). Information that is grounded in reality but used to cause harm to an individual, group, or nation is referred to as malinformation (Wardle, Derakhshan, 2017).

Social Media Misinformation

By the 2000s, social media has given everyone the opportunity to share information with the world. This caused the production of abundant unverified information every minute. The unique features of social media like *algorithms, echo chambers, filter bubble*s make the fake news spread differently from other traditional media like television, newspapers, radio, etc. The volume of information that is shared on these platforms and the ability of these decentralized networks to spread material (Benkler et al., 2018) and the prevalence of numerous deception techniques, including trolls, bots, and astroturfing (Arce-García et al., 2022; Chan, 2024) make them the perfect environment for the spread of fake news (Alonso-Muñoz et al., 2024). This causes misinformation to affect society more now than it did in the past (Zimmer et al., 2019). A study by (Vosoughi et al., 2018) states that false news spreads six times more quickly online than accurate information, and 70% of users are unable to tell the difference between the two. Lately, the 2016 US presidential election and the 2020 COVID-19 pandemic have witnessed this intense wave of fake news spread through social media. By the end of the 2016 US presidential election, it was estimated that over 1 million tweets contained fake news (Aïmeur et al., 2023; Pizzagate Conspiracy Theory, 2025).

Sentiment analysis of the comments on misinformed posts helps to analyse the emotions of social media users about the misinformed post. A study by (Zollo et al., 2015) shows that the comments of a conspiracy post have more negative emotions than positive emotions. However, there are studies that show different results. A study by (Castillo et al., 2011) revealed that greater sentiment, both good and negative, but especially more positive, is often displayed by fake and untrustworthy news.

Fact-checking

In the 1920s and 1930s, internal fact-checking began to take center stage in American news periodicals. In the 2000s, external fact-checking made its debut in the United States. External fact-checking is publicizing an evidence-based evaluation of the veracity of a political assertion, news

article, or other public document (Graves, Amazeen, 2019). Fact-checking was initially conceived of as women's work, and it remained so through the 1970s. A 1971 book, No Experience Necessary: A Guide to Employment for the Female Liberal Arts Graduate, listed fact-checking as one of many possible jobs for young women, describing it *as a grisly job involving a lot of work, research skill, and judgment* (Dickey, 2019; Friedman, Schwartz, 1971; *The Rise and Fall of Facts,* 2019).

In the 2000s, fact-checking gained popularity through three dedicated fact-checking organizations run by professional journalists: FactCheck.org, which started in 2003, and PolitiFact and the Washington Post's Fact Checker, both of which were launched in 2007 (Graves et al., 2016). Even though verifying facts has consistently been a fundamental practice in journalism, the nature of the fact-checking carried out by these sites differed from that of conventional journalism. In this type of reporting, fact-checkers resolve factual disagreements using a process akin to the scientific method (Robertson et al., 2020).

Fact-checking sites now integrate AI into their daily working process. Using AI fact-checkers can analyze a larger volume of data, earlier claim detection, automate mechanical tasks, and even engage with users (Gutiérrez-Caneda, Vázquez-Herrero, 2024). The trustworthiness of fact-checking services depends on their parent organization's aim and their funding (Brandtzaeg, Følstad, 2017). A study conducted among the residents of Singapore by (Lim, Perrault, 2023) showed that there is a contradiction between the stated trust and actual reliance on different fact-checking sites. Accordingly, in the experiment survey the people showed more trust in the government-based fact-checking sites, but behaviourally participants adhered more strongly to fact-check labels provided by AI-based fact-checking systems than those provided by the government.

2. Materials and methods

The study consists of two parts. The first part focuses on assessing the verification of misinformation by fact-checking sites, and the second part analyses the sentiment of people toward this misinformation.

Selection of Fact-Checking Sites and Misinformation

This study included fact-checking sites that are verified signatories of the IFCN Code of Principles. The International Fact-Checking Network (IFCN) at Poynter was established to unite the growing international network of fact-checkers. Signatories of the IFCN Code of Principles undergo a vetting process by external assessors, requiring them to demonstrate commitment to non-partisanship and fairness, transparency in sources, funding, organization, and methodology, as well as a dedication to open and honest corrections (IFCN, 2024). Among the active signatories of IFCN on 25 September 2024, we took the fact-checking sites that are in the English language. 38 Fact-checking sites were in English language and among these, 2 of the sites didn't have an option for searching the fact-checks. So a total of 36 Fact-checking sites were taken for the study.

Among the misinformation that spread on social media during the last three years (2022, 2023, and 2024), four misinformation were selected, each representing the categories: political misinformation, misinformation in sports, health misinformation, and misinformation in the general category. The misinformation was selected randomly. Political misinformation selected for the study is a Facebook post in 2024 that tells U.S. presidents can cancel or postpone federal elections (Charlie Kirk, 2024). An image of Lionel Messi holding the flag of Israel that spread on Instagram during 2023 was taken for the category of misinformation in sports (Doctorgadsaad, 2023). Health misinformation selected for the study is an X (Twitter) post in 2022 that states monkeypox is a result of coronavirus vaccination (Sudden and Unexpected, 2024). Misinformation about Elon Musk announcing Tesla House for $10,000 was taken in the category of general misinformation (Facebook, 2024).

Searching for misinformation in the fact-checking sites

The fact-checked news of the four misinformation was searched in each fact-checking site using appropriate search terms. For searching the fact-checking news of the cancellation of the election by the US president, the search terms used were *US election* and *Cancel election.* The search terms used for the fact-checked news about Lionel Messi holding the Israel flag were *Messi* and *Israel,* for the misinformation about monkeypox, the search term was *monkeypox*, and for the misinformation about Tesla's house, the search term was *Tesla.*

Analysing the sentiment of the comments

The social media posts that spread this misinformation were identified, and their comments were extracted using the website exportcomments.com (Export Comments, 2024). This website downloads 100 comments for free. This free version is used for this study. An Excel add-in called

Meaning Cloud is used to analyze the level of agreement and sentiment of the comments. Meaning Cloud is a commercial, knowledge-based sentiment analysis tool. To determine the global polarity value for the entire text, it uses a dictionary to determine the local polarity of various sentences or grammatical structures inside the text and assess the connections between them (Zaeem et al., 2020; MeaningCloud, 2024). Meaning Cloud stopped its services on 30th January 2025. This analysis was done before this date, in December 2024. The sentiment of comments is shown in five categories, Very Positive (P+), Positive(P), Neutral (NEU), Negative (N), and Very Negative (N+). Meaning Cloud fails to understand the sentiment behind the emojis and some other comments and reports it as Error and None, respectively. The level of agreement in the comments is also obtained through the meaning cloud. The output is labeled as Agreement and Disagreement.

3. Discussion

After being filtered according to the websites' English language and news search capabilities, a total of 36 fact-checking websites were selected for the study. Table 1 shows the fact-checking sites and their country of origin. 9 of the fact-checking sites are from the United States of America, 7 of them from India, 3 each from the United Kingdom and Australia, and 2 each from the Philippines and France.

Table 1. List of fact-checking sites and their country of origin

Country	Number	Fact-checking sites
United States	9	Ap fact check, Check your fact, Factcheck.org, Reuters,
India	7	Boom, Digital Forensics, Research and Analytics Centre
Australia	3	Australian associated press, Rmit abc fact check,
UK	3	Fullfact, Lead stories, Pa media.
France	2	AFP Fact Check, Science feedback.
Phillipines	2	Verafiles incorporated, Pressone.PH.
Africa	1	Africa Check
Bosnia and Herzegovina	1	Raskrinkavanje
Canada	1	The canadian press
Georgia	1	Myth detector
Hong Kong	1	Annie lab
Ireland	1	FactCheckNI
Kenya	1	Pesacheck
Nigeria	1	Premium Times Center for Investigative Journalism.
United Nations	1	Mediawise
Zimbabwe	1	Fact check zimbabwe

Verification of the Misinformation by the Fact-Checking Sites

The fact-checking websites were searched for the fact-checked news of each of the four misinformation. The Table 2 shows, among the fact-checking sites listed, only 4 sites verified the misinformation about the US president's power to cancel or postpone the US presidential election. These fact-checking sites are AFP Fact Check, PolitiFact, Premium Times Centre for Investigative Journalism, and USA Today. 10 of the fact-checking sites verified the misinformation of Messi holding the Israel flag. The fact-checking sites AFP Fact Check, Boom, Check Your Fact, D-FRAC, Factly Media and Research, Leadstories, Newsmeter, Reuters, The Quint, and USA Today checked this misinformation. The misinformation that claims monkeypox is caused by coronavirus vaccination, is verified by 15 fact-checking websites. Of the 36 websites, just four fact-checked the misinformation regarding Tesla House. These websites are Snopes, Politifact, Leadstories, and Check Your Fact. None of the fact-checking sites fact-checked all the four misinformation. The fact-checking sites like AFP Fact Check, Leadstories, and USA Today have fact-checked at least 3 of the misinformation.

Table 2. Verification of misinformation by fact-checking sites

S	Fact-Checking Sites	Political	Sports	Health	General
1	Africa Check	No	No	No	No
2	AFP Fact Check	Yes	Yes	Yes	No
3	Ap fact check	No	No	Yes	No
4	Annie lab	No	No	Yes	No

S	Fact-Checking Sites	Political	Sports	Health	General
5	Australian associated press	No	No	Yes	No
6	Boom	No	Yes	No	No
7	Check your fact	No	Yes	No	Yes
8	Digital Forensics, Research and	No	Yes	Yes	No
9	FactCheckNI	No	No	No	No
1	Factly media & research	No	Yes	No	No
1	Fact check zimbabwe	No	No	No	No
1	Factcheck.org	No	No	Yes	No
1	First check	No	No	Yes	No
1	Fullfact	No	No	Yes	No
1	Lead stories	No	Yes	Yes	Yes
1	Mediawise	No	No	No	No
1	Myth detector	No	No	No	No
1	Newsmeter (fifth estate digital	No	Yes	No	No
1	Pa media	No	No	No	No
2	Pesacheck	No	No	No	No
2	Politifact	Yes	No	Yes	yes
2	Premium Times Center for	Yes	No	No	No
2	Press Trust of India	No	No	No	No
2	Pressone.PH	No	No	No	No
2	Rmit abc fact check	No	No	Yes	No
2	RMIT factlab	No	No	Yes	No
2	Raskrinkavanje	No	No	No	No
2	Reuters	No	Yes	Yes	No
2	Science feedback	No	No	No	No
3	Snopes.com	No	No	No	Yes
3	The canadian press	No	No	Yes	No
3	The dispatch	No	No	No	No
3	The quint	No	Yes	No	No
3	Usa today	Yes	Yes	Yes	No
3	Verafiles incorporated	No	No	No	No
3	Wisconsin watch	No	No	No	No

Level of Agreement in Comments

Table 3 shows the level of agreement with the misinformation in their comments. The total number of comments for the political misinformation post on Facebook was 70. Among these 70 comments, 53 (75.7 %) of the comments agreed with the statement. A total of 17 (24.2 %) disagreed with this misinformation. That is, the majority of the people who commented (75.7 %) believed that U.S. presidents can cancel or postpone federal elections. Among the 105 comments for the sports misinformation post on Instagram, 66 (62.8 %) of the comments showed agreement with the misinformed statement and 32(30.5 %) of the comments disagreed with this statement. 5(4.7 %) of the comments were not analyzed by the meaning cloud plugin and were shown as errors. The majority of the people (62.8 %) who commented, believed that Argentina footballer Lionel Messi was holding the flag of Israel. A total of 100 comments were analyzed from the health misinformation post, of these 90(90 %) comments showed agreement with the misinformation. A total of 10(10 %) comments disagreed with this misinformed statement. The majority of the people commented (90 %), believed that monkeypox is caused by coronavirus vaccination. A total of 90 comments were there for the post on Facebook about Elon Musk announcing Tesla house for $ 10,000. Among these 90 comments, 79(87.8 %) of the comments agreed, and 6(6.7 %) of the comments disagreed with this misinformed statement. 5 (5.5 %) of these comments were not analyzed by the meaning cloud and were shown as errors.

Table 3. The level of agreement on misinformation in comments

Agreement	Political	Sports	Health	General
Agreement	53 (75.7 %)	66 (62.8 %)	90 (90 %)	79 (87.8 %)
Disagreement	17 (24.2 %)	32 (30.5 %)	10 (10 %)	6 (6.7 %)
Error	0 (0 %)	5 (4.7 %)	0 (0 %)	5 (5.5 %)
Total	70	103	100	90

Sentiment analysis of comments

Table 4 analyses the sentiment in the comments of the four misinformed posts. For the political misinformation zero comments showed very positive sentiment, 11 comments had a positive reaction, 27 were negative and 8 were very negative. A total of 8 comments were identified as neutral comments and 16 comments were identified as none. Of the total comments in the misinformed post of Messi holding Israel's flag, 2 comments had a very positive sentiment about the misinformation and 29 had a positive sentiment. 12 of the comments had a neutral statement. 22 comments had negative and 8 comments had very negative sentiments. Sentiment of 27 comments were identified as none. Out of all the comments analyzed on the health misinformation post, no comments showed a very positive sentiment. 20 comments showed a positive sentiment, 4 had a neutral sentiment, 25 had a negative and 5 had a very negative sentiment. 46 comments were classified as having no sentiment. In the misinformed post about Tesla House, 17 comments showed very positive sentiment, and 32 had a positive sentiment. 3 had neutral sentiment and 3 comments had negative sentiment. Only one comment had a very negative sentiment.

Table 4. The sentiment of comments on misinformation

	Political	*Sports*	*Health*	*General*
P+	0	2	0	17
P	11	29	20	32
NEU	8	12	4	3
N	27	22	25	3
N+	8	8	5	1
None	16	27	46	29
Error	0	5	0	5
Total Comments	70	105	100	90

4. Results

The study is divided into two parts. The first part analyses the rate of fact-checking by the fact-checking sites and the second part analyses the sentiment and level of agreement of the comments on the misinformed post.

Our research shows a concerning discrepancy in fact-checking systems' responsiveness. Our findings show that the agreement level in all of the selected misinformation is higher than the disagreement level, suggesting that most people believed this misinformation. At the same time, only a very few fact-checking sites fact-checked all this selected misinformation. When evaluating the efficiency of fact-checking sites, the misinformed posts that most of the users believed are mostly not fact-checked by these sites; in other words, it implies that fact-checking hasn't reached the people, which made the people believe in that misinformation. This agrees with the studies by Lewandowsky et al. (Lewandowsky et al., 2012) and Nyhan and Reifler (Nyhan, Reifler, 2010) which states that fact-checking has less impact on people. Another study by Barrera et al. (Barrera et al., 2020) studied on the misinformation during 2017 French presidential election shows a similar result that while fact checking improves factual knowledge, it does not significantly alter voting intentions. Fact-checking can have a modest corrective influence under certain conditions (Graves, Amazeen, 2019). Upon examining user reactions to the disinformation posts, we found that, for every post we chose, the general level of agreement in the comments consistently exceeded the level of disagreement. This pattern implies that rather than questioning the inaccurate information, users choose to accept and believe it. Such a broad consensus could reinforce echo chambers where incorrect information is normalized and aid in the propagation and perceived legitimacy of misleading information.

We can't draw any generalizations after analyzing the sentiment of the comments and the misinformed posts. The political and health misinformed posts have comparatively higher negative sentiment, while the other two posts have comparatively more positive sentiment. This agrees with the disparities we discussed before. Zollo et al. (Zollo et al., 2015) discovered that comments on conspiracy-related posts display a predominance of negative emotions, and a study by Zaeem et al. (Zaeem et al., 2020) and Hamed et al. (Hamed et al., 2023) found a significant relationship between negative sentiment and fake news, whereas Castillo et al. (Castillo et al., 2011) noted that fake and untrustworthy news tends to generate stronger sentiment overall, especially in terms of positive emotions. Positive sentiment was shown in a study by Scannell et al. (Scannell et al., 2021)

of comments on Covid vaccine-related misinformation. A study by Mir and Sevukan (Mir, Sevukan, 2024) also showed similar positive sentiments for COVID-19 vaccine-related Indian Tweets. So the result suggests that emotional responses may vary depending on the type of misleading content and its context.

This study had various limitations. First, we selected the misinformation randomly; there is a chance that the fact-checking sites don't fact-check these sites, but may have the other, and vice versa, also may have happened. We used a Google Chrome extension to download the X (Twitter) comments, and the free version was used, which reduced the evaluation to 100 comments only. For sentiment analysis and understanding the level of agreement, we used an application that will not be as effective as manual understanding of the comments.

5. Conclusion

Misinformation is one of the major problems faced by the 21st century. Misinformation spreads through social media at a faster rate than true information. The fact-checked information doesn't reach the social media users like the misinformation. Analyzing the fact-checking sites shows that most of the fact-checking sites don't fact-check all the misinformation, which in a way is impossible to do. The comments under the misinformed posts are mostly agreeing in nature, which shows that many people believe misinformation, so a more effective kind of fact-checking system should be promoted, or a new kind of way to make people more aware of the misinformation happening around.

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