Media Literacy: Evidence from the Pandemic

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For literacy concerns the historically and culturally conditioned relationship among three processes: the symbolic and material representation of knowledge, culture and values; the diffusion of interpretative skills and abilities across a heterogeneous population; and the institutional management (by public and private sector bodies) of the power that access to and skilled use of knowledge brings to those who are "literate".

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Abstract

As COVID-19 pandemic progressed, media literacy rose out from the shadows of evergreen academic and policymaking debates to finally became a protagonist resilient strategy. Against countless dangers of the digital era, media literacy appears today as a useful umbrella concept pointing at imperative skills for anyone prepared (or not) to navigate the current media environment. From this stance, several international organizations place media literacy on the spotlight when calling for urgent worldwide measures against other global epidemics such as: infodemic, fakenews, disinformation; post-truth, radicalization or hate-speech; cyberterrorism, trollying, digital bullying, surveillance or invasion of privacy; buying and selling of personal data; narcissism and addiction to social media; anxiety, depression or self-harm, and the list could go on and on. This paper presents a systemic evidence review of quantitative empirical research conducted during the peak of the global pandemic uncovering multiple understandings, key obstacles and conceptual adjustments needed before considering media literacy a definitive transformative tool.

Keywords: media literacy, information literacy, digital literacy, evidence review, critical thinking, post-COVID

As COVID-19 pandemic progressed, media literacy became a key resilient strategy against countless dangers: infodemic, fakenews, disinformation; post-truth, radicalization or hate-speech; cyberterrorism, trollying, digital bullying, surveillance or invasion of privacy; buying and selling of personal data; narcissism and addiction to social media; anxiety, depression or self-harm, to mention some. Early 2020, for instance, UNESCO's Media and Information Literacy Alliance, declared that "media and information literacy is necessary every day, but especially during turbulent times when misinformation runs rampant" (UNESCO, 2020). From this stance, the UN saw on the worldwide health

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emergency an opportunity to "shout clarion call of media and information literacy for all" (*ibid.*). From its part, NATO funded diverse activities to position "media literacy as a way to help insure resiliency and problem solving-skills, providing people with the agency they need as active participants in the online and offline worlds" (Jolls, 2022).

Similarly, when calling for "moving [media literacy] from marginal to a mainstream topic of concern", the EU also recognises media education, especially information and digital literacy as "a change in how citizens of all backgrounds approach, use and understand media, not only as consumers, but also as producers and players in the sophisticated media environment in which we all function" (Reynolds, 2023). In the same line of efforts, the OEA states that "given the context of the pandemic, the States must accelerate the processes involved in designing and implementing public policies that in the short-term guarantee both quality access and the development of digital skills through the launch of digital literacy programs with a human rights perspective" (OAS, 2021: 9). Along these lines of action and focusing on digital literacy, the WHO's *Public Health Agenda for Managing Infodemics* (2021) recommends governments to:

> test critical thinking and literacy theory (e.g. around health literacy, information literacy, digital literacy and news literacy) as interventions to address infodemics […] Information, news, digital, and media literacy all speak to the necessary ability to distinguish high- from low-quality information, especially online. Although research into each type of literacy has developed in isolation, questions remain on how to empower populations to think critically, what normative models of thinking are most appropriate for an infodemic, who is responsible for building literacy, and how literacy efforts can be integrated into existing societal systems (e.g. school education) and adapted to reach populations outside of traditional education settings.

Indeed, the call for strengthening media literacy in a post-pandemic world might sound as an "era where it is finally coming out of the shadows and taking its place as an important global discipline" (Jolls, 2022: 12). Nevertheless, several conceptual and practical key issues persist as *media literacy* remains meaning "many things to many people" (Brown, 1998: 44). As an umbrella term, especially during these "turbulent times", the term refers, for instance, to key (but frequently countless) abilities to cope with unprecedented social conditions and technological transformations (i.e: Cino *et al.*, 2022; Haddon *et al.*, 2023; Livingstone *et al.*, 2021). From this stance, media literacy also acquires a halo of "magical force" (Potter, 2022) to fight the (again, countless) dangers of living through and among screens.

As the use of "media literacy" grows as an umbrella term, so too do the challenges ahead in terms of both, conceptualization and practice. Before considering media literacy —or its sibling terms such as: media education, information literacy, digital literacy, social media literacy— as a panacea for all the dangers imposed by the current digital environment, this paper presents current empirical evidence that weights the actual potential of media literacy as a transformative tool. It starts by mapping multiple

understandings around media literacy (first part) to set the ground for a systemic review of empirical evidence collected during the global pandemic (second part). The analysis (final part) uncovers multiple understandings, key obstacles and conceptual adjustments needed before considering media literacy a definitive transformative tool.

I. Media literacy: scope, reach and limits

Definitions of and practices to promote media literacy tend to flourish, readapt and radically change with every mass media technology. This constant trend of change has led to complex terminological disputes around vague and broad understandings of the term (Cervi *et al*., 2010; Christ and Potter, 1998; Jolls and Wilson 2014; Livingstone, 2003; Martens, 2010; Palsa and Ruokamo, 2015; Potter, 2022; Rosenbaum *et al*., 2008; Schwarz, 2005; Turin and Friesem, 2020). At is most basic definition, media literacy refers to the "active inquiry and critical thinking about the messages we receive and create" (NAMLE, *Core Principles* quoted by Hobbs and Jensen, 2009: 7). Nevertheless, researchers, practitioners and policy makers, have long debated about the conceptual challenges embedded on "critical thinking" (i.e., Jolls, 2022; Livingstone *et al*. 2008; Palsa and Ruokamo, 2015; Potter, 2022; Rosenbaum *et al*., 2008; Turin and Friesem, 2020) and "active inquiry" (i.e., Brown 1998; Duncan, *et al*., 1989; De Abreu and Mihailidis, 2014; Fedorov and Mikhaleva 2020; Hobbs and Jensen, 2009; Martens, 2010; Masterman, 1989, 1985; Potter 2019). "The concept of media literacy, like that of literacy itself," writes Livingstone (2003: 1-4):

> has long proved contentious […] History tells us that even the narrow and common-sense meaning of the term —'being able to read and write'— masks a complex history of contestation over the power and authority to access, interpret and produce media texts.

From this stance, media literacy concerns not only interpretative responsibilities of the individual in active inquiry and critical thinking. This approach also recognizes the relationship among content —text, audiovisual or digital—, competence —skills and techniques— and power —individual and institutional (Livingstone, 2004a: 18).

1. Access to content

When the focus is placed on the opportunities and challenges of locating content (be it text, audio or image) through different analogue or digital media platforms, access becomes a key prerequisite of media literacy (Livingstone, 2003). Here, the general assumption is that one simply will not be able to achieve and possess certain skills —i.e., to read and write; to *be literate* (Williams, 1983: 188, quoted by Livingstone *et al*., 2008)— if one has not access to the technology that aims to master (Kintgen, *et al*., 1988).

From printed texts to digital platforms, access to media, has, however, proven to be "a dynamic social process, not a one-off act" (Livingstone, 2004a: 4). For instance, when transposing a broad conception of *literacy* to the current digital environment, concepts

such as "the digital divide" map different characteristics and conditions that shape people's digital inclusion or exclusion. Three different levels of digital divide present thoughtful accounts about the nature of the relationship between access, use, context and outcomes when engaging (or not) on the digital environment (Haddon *et al.*, 2023; Halford and Savage, 2010; Hargittai, 2002; Helsper and Eynon, 2013). From this stance, barriers or enablers of digital engagement do not resume to initial access (first-level digital divide), but are further examined in relation to diverse personal and contextual characteristics (second-level digital divide), as well as to tangible outcomes of the engagement with the technology (third-level digital divide).

It might, for instance, not enough to determine that children in rich countries do have access to media technologies and are thus media literate, while children in poor countries do not have access to the technology and thus, are media illiterate. Researchers have long argued that in order to understand the reach and limits of media literacy, what are needed are thoughtful explanations as to why and how these children (rich or poor) are engaging (or not) with media technologies, and how this engagement translates (or not) into diverse tangible outcomes such as informational benefits, active civic participation or awareness of harmful risks online, to mention some of the pending tasks in the current digital environment (i.e., Haddon *et al.*, 2020; Livingstone *et al.*, 2021).

There is, naturally, a considerable variety of roles that media literacy plays in relation to access to media content. An approach to literacy as medium dependent recognizes the complexity of the relation among the platform and users' specific characteristics or competences (Livingstone, 2004b; Martens, 2010). From this stance, the interface design and functioning, as well as the context in which individuals are using different media platforms are approached as indications of social uses as key variables of media literacy. Media literacy is thus described as a process determined by the interaction between content, individual skills and media platforms within dynamic trends of social, institutional and technological changes (Brown, 1998; Buckingham, 2003; Jolls, 2022; Livingstone, 2003).

2. Countless literacies and multiple competences

From their part, definitions of media literacy and media education practices that focus on specific skills or competences tend to place the spotlight on the individual when pointing at certain personal abilities and knowledge useful across all media (Arke and Primack, 2009; Hobbs, 2010; Jensen, 2009; Potter, 2019, 2022). This is, for instance, the case of media literacy definitions promoted by the US National Association of Media Literacy Education such as: "the ability of a citizen to access, analyse, and produce information for specific outcomes" (Aufderheide, 1993; NAMLE, 2007).

The policy approach of the British Office of Communications (OFCOM) draws on a parallel conceptualization when defining media literacy as "the ability to use, understand and create media and communications in a variety of contexts" (OFCOM, 2004: 2). Alike, the European Commission states that media literacy "refers to skills,

knowledge and understanding that allow people to use media effectively and safely" (EC, 2023: 2). Other widespread definitions of media literacy build upon multiple literacies (i.e., news literacy, television literacy, film literacy, computer literacy, internet literacy and digital literacy and so forth) to composite an umbrella concept that look beyond media content to harmonize and encapsulate not only diverse skills, competences and attitudes, but also social and economic variables that also play a key role as barriers or enablers of literacy (Buckingham, 2003; Duran *et al*., 2008; Lankshear and Knobel, 2008; Livingstone, 2003).

This is, for instance, the approach of UNESCO to "media and information literacy" (MIL) that encompasses at least 23 different literacies (visual, social, civic, news, privacy or critical literacies plus a wide range of media-related literacies such as: TV, cinema, internet or AI literacies); 17 sets of skills and knowledge (i.e., critical thinking, problem solving, creativity, collaboration, organization, participation, analysis, synthesis, production, diffusion, to mention some); along with 6 groups of key values and attitudes (solidarity and peace; human rights and dignity; awareness of self and challenges of one's own beliefs; tolerance and respect of others; freedom of expression and freedom of information; intercultural and interreligious dialogue) that can be encouraged by media and information literacy competences (UNESCO, 2021: 10, 16). From this stance:

> MIL is an umbrella term that encompasses various and evolving competencies required to navigate today's increasingly complex communications environment. MIL empowers citizens with critical thinking and other necessary competencies to enable their informed and ethical engagement with the integration of content, institutions providing content (and providing opportunities to produce and share own content), and digital technologies. MIL further aims to support users' purposeful and creative use of digital technology, and enhance knowledge of rights online, such as privacy rights and ethical issues concerning access to and use of information. In this way, MIL contributes to fostering intercultural dialogue, gender equality, access to information, freedom of expression, and peace and sustainable development in an increasingly digital society (UNESCO, 2021: 6).

Facing ever-changing media technologies, definitions of media literacy that address diverse challenges and that can be applied across all social contexts and media platforms are surely useful. Besides, a skills-based approach to media literacy leads to instrumental assumptions over the technology and hopeful expectations about individuals (be them audiences, citizens, prosumers) as critical thinkers capable to recognize misleading information withstanding the technology (Aufderheide, 1997; Buckingham 2020; Livingstone 2004b). Let us say: students able to identify weak arguments on books; journalists unwilling to print fake news; senior citizens aware of sponsored content on diverse analogue or digital platforms; teenagers conscious of deceptive advertising on movies; parents alerting about stereotypes on TV; citizens against polarization on digital chats; consumers mindful of trolling on websites; companies pursing anti-data thieve on social platforms; children prepared to face surveillance on on-line gaming, to

mention only some of the great hopes around media literacy.

3. Power

Nevertheless, "literacy is not and never has been", writes Hartley (2002 quoted by Livingstone 2004b: 10) "a personal attribute or ideologically inert 'skill' simply to be 'acquired' by individual persons [...] It is ideologically and politically charged –it can be used as a means of social control or regulation, but also as a progressive weapon in the struggle for emancipation". In other words, when power is taken into consideration, definitions of media literacy move from the potential (or backlash) of new technologies to the analysis of complex political and social variables such as: social policies (i.e., regulation, education or the lack of both); media language (who creates and how to create meaning from media); representation (how media claim to represent reality); production (who makes the media, how and why); audiences (who uses the media, how and why) (Buckingham, 2019, 2020; Kellner, 2002; Kress, 2003; Masterman, 2010).

"Unfortunately", writes Buckingham, (2020: 235), "these issues are much more complex and difficult to teach about than policy-makers imagine". This is, from a power-oriented approach to media literacy, definitions and practices also tend to differ because they are shaped by several factors related to the context and nature of media as the focus is placed on individuals (children or adults, for instance), media technologies (analogue or digital) or institutional contexts (i.e., families, schools, governments, media organizations, etc.).

4. Measurement

Identifying with certain range of clarity different approaches to and dimensions of media literacy, is indeed a hazardous enterprise, especially in a post-pandemic world when general understandings and sound educational practices seem to be so desperately needed. Nevertheless, it is only part of the problem since related to issues of definition are questions of measurement. This is, more common than not, empirical evidence about media literacy is difficult to measure, systematize and compare (Martens, 2010; Potter and Thai, 2019; Ptaszek, 2019; Schilder *et al*., 2016).

In other words, tracing, measuring and comparing empirical evidence about diverse range skills and efforts to promote media literacy in both, formal or informal settings becomes a tangling endeavour when the links between gradations of inclusion (i.e., I use social media for X, Y or Z); own perceptions of proficiency levels (i.e., Am I skilful user of social platforms?); expectations, social desirability or predictors (i.e., How and what for should I be using social media?), and; breath of use (i.e., How often do I use social media or what are the practical outcomes of my engagement on these platforms?) are not clearly stated or are simply too difficult to trace (Van Deursen and Van Dijk, 2008; Helsper, *et al*. 2021).

Summing up, researching and putting media literacy to work in this "new era" possess great challenges: definitions abound, so the risks on the digital environment in need of

it as quick remedy; access, analysis, and production (the very basics of media literacy) definitely acquired new forms when social interactions transited from off- to on-line life yet, the reach of these transformations are still not fully understood; helping all (especially young people and senior citizens) to develop a critical understanding of the media (hopefully not just about the technology, but also about its practices and institutions) is a now a priority for parents, schools, governments and international organizations making the dialogue among diverse interests, priorities and policies very difficult.

If COVID-19 pandemic placed media literacy on the spotlight as a "strategic defense strategy" (Jolls, 2022), key questions arise as to whether its conceptualization and practice will be able to deliver those great expectations. It is also puzzling how researchers and practitioners are working out common conceptualizations and operationalisations of a concept and practices that acquire a myriad of meanings and forms around the world.

Building on these concerns, this paper uncovers current evidence about the scope and reach of media literacy during the global pandemic to:

(1) reveal the scope and reach of media literacy efforts during the world pandemic
(2) assess empirical evidence about the reach and limits of media literacy against general expectations
(3) identify how media literacy was conceptualized in these studies
(4) recognize different dimensions and variables related to media literacy looking for a conceptual framework that puts these diverse approaches at dialogue and that might inform new research and interventions

II. Method

To spot key findings about the nature and reach of media literacy coming from most recent research conducted during the peak of the global pandemic, this paper presents the results of a systemic evidence review (Gough *et al*., 2012; Grant and Booth, 2009; Sutherland, 2004) conducted on the electronic resource Web of Science (WoS). WoS is an electronic integrated Web-bases resource that provides access to multiple academic databases. It allows searches across a wide spectrum of areas of studies and resources. Following the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guidelines (Moher *et al*., 2015), the search in WoS was guided by the following research questions:

(1) In terms of conceptualisation, what can be learned from the empirical findings regarding media literacy during the world pandemic?
(2) How was media literacy operationalised during these turbulent times?
(3) Should / can be the approach to media literacy be different? If so, how and what for?

1. Search and selection

Guided by the three research questions posed above, the search of relevant evidence

on WoS was conducted based on keywords, titles and abstracts to English language academic journals published from the first global outbreak of COVID-19 (March 2020) to January 2023, when the search was conducted. After few test searches, the inclusion and exclusion criteria was determined by three groups of search terms: (1) literacy terms (recognizing, as discussed in previous pages, the broad scope of the term "media literacy"), but with specific focus on media related literacies (i.e., information literacy, digital literacy, media education, visual literacy, social media literacy, etc); (2) COVID and world pandemic terms (to identify lessons learnt from the global pandemic, but excluding a large cohort of research focused on health literacy, vaccination and health related topics that while significant, are not the focus of this paper); (3) case study research terms (to identify outcomes of media literacy at empirical research). The final search query acquired a form similar to: literacy terms (NOT health, environmental OR natural science literacies) AND world pandemic terms AND case study research terms.

Following the guidance of similar relevant systemic evidence reviews (i.e., Haddon, 2023; Livingstone, *et al*. 2021; Vissenberg, *et al*. 2022), Figure 1 shows the 3,196 overall results (N_0) coming from the initial search. These were narrowed on WoS to most relevant areas of study according to the research questions posed for this systematic review, leaving 608 results. Sorting out non-English, non-article, non-original research or non-peer-reviewed publications showed 206 results (N2). The title and abstract of these entries were screened for eligibility according to the following criteria: (1) research conducted during the world pandemic; (2) studies using quantitative methods (i.e., surveys and questionnaires); (3) on representative populations (e.g. small samples or instrument pilots were excluded), and (4) research rigour. This screening left 56 studies (N3) to be read in full. 32 studies did not meet the criteria or full text was not found. 24 (N4) were retained and analysed. Research that was not conducted during the COVID-19 pandemic or did not state the date when it was conducted, and not showed solid evidence was excluded, leaving 16 studies for full coding and analysis (N5).

2. Analytical strategies

The 16 papers included in this systemic evidence review, address different topics, populations and accordingly, present findings in diverse topics and areas of study. Table 1 shows these diversity and part of the coding table that was used to organize this disperse range of evidence.

As showed and among others, the coding table included different categories such as: reference; organizer of the country and demographics of the population under evaluation; research focus; kind and definition of media literacy used; key findings and main conclusions. Each study was coded accordingly and a thematic analysis was conducted using software that allowed cross references and categorizations across such a diverse corpus of information. The analysis of diverse classifications and sets of information was mainly deductive, as the associations and categories were based on previous research literature. The following pages show how the information was organized and present the results of this review according to the three research questions posed.

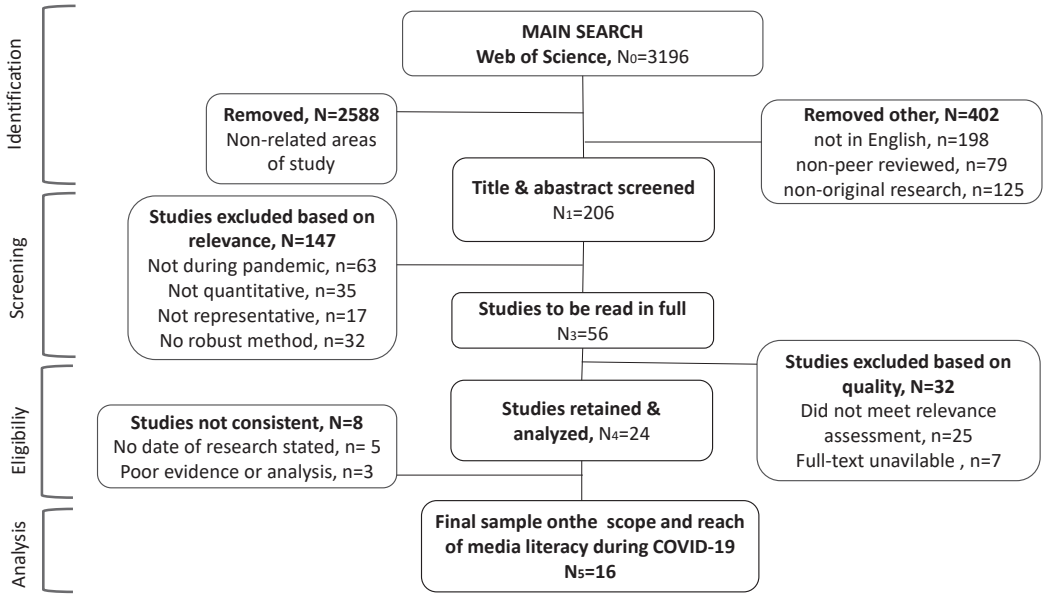

Figure 1. Flow diagram of the selection and screening process

III. Results and discussion

The papers selected were published in 16 different journals that cover an ample range of areas of study: from education, technology, communication or psychology, to teaching, librarianship and computer science. Naturally, this variety represents the traditional multidisciplinary scope of empirical research on media literacy. Accordingly, diversity is also shown on the population and demographics studied across the papers reviewed. Overall, young adults attracted great part of researcher's attention. As a result, in terms of age, despite the fact that the studies reviewed covered an ample rage of demographics, from pre-school children (mean age of 5.1) to older adults (mean age of 62), young adults (mean age 25) were the population that received most attention from researchers all over the world.

In terms of occupations, college students, teachers in training and librarians were the main focus of study among the papers reviewed. This could be explained partly, by the time frame used to select the papers. Due to the challenges imposed on digital learning and education during the lock-down period, students and teachers attracted great part of researcher's attention in searching for a better understandings of information literacy and its relation to the causes of and the processes embedded on infondemic, sharing information trends or problematic smart phone use that reported higher rankings during the COVID-19 pandemic.

Also, as showed in Table 1, the research reviewed was conducted in several countries (n=12), covering practically all the regions of the world. Nevertheless, Latin America, Asia and the Arab world were under represented. This might be explained by English

language being set as one of the selection criterion. Perhaps for this same reason, it was the USA the country with more eligible studies (n=3) in the database, followed by China (n=2).

Table 1. Coding process: overview

Study #	Reference	Country	Population	Date of data collection	Research topic	Flag	Level of literacy	Key finding
2	Aslan, S. (2021)	Turkey	pre-service teachers	2nd-13th March 2020	Digital Literacy (DL) self efficacy	Measuring Media Literacy (ML)	Limited	DL self-efficacy level varies according: gender, field of study & computer use. No variation: class level, university entry score, purpose of use technology
3	Belvoncikova, E. & Ciderova, D. (2022)	Slovakia	college students	April – May 2022	ML: multiple intelligences	Measuring ML	Limited	Better understanding of communication processes; less understanding of ML
4	Hoobs, R. *et al.* (2022)	USA (RI)	different stakeholders	Academic year 2020-2021	ML: implementation of instructional practices	Implementing ML	Deficient (instructional practices)	Differences on ML implementation due to: tech limitations, school policies, academic practices, student's perceptions, educators' response; rather than: geographic location or socioeconomic status
6	Igbinovia, M. *et al.* (2020)	Nigeria	college students	COVID lock-down	Information Literacy (IL): level & outcome	ML as moderator (fakenews)	Satisfactory	High levels of IL, low level of COVID-19 pandemic fakenews. Infodemic causes: too much info & impossibility to spot fakenews
9	Krelova, K. *et al.* (2021)	Czech Republic	college students	COVID lock-down	DL: levels according specialization & level of study	Measuring ML	Limited	DL varies with experience: specialization, studies level & study form
10	Li, Q. *et al.* (2022)	China	college students	COVID lock-down	Self-efficacy, proxy efficacy, ML & official media use	ML as moderator (COVID as health emergency)	Limited	Official media use as a negative moderator on the association between ML and proxy efficacy or self-efficacy
11	Linde-Valenzuela, T. *Et al.* (2022)	Spain	pre-service teachers, parents & students	Academic year 2019-2020	DL	Measuring ML	Satisfactory (teachers in training) Deficient (parents and pupils)	Teachers in training: highest DL especially informational & computer competences. Parents & pupils: low DL
12	Lund, B. and Wang, T. (2022)	USA	old adults	Summer 2021	IL & well-being	ML as moderator (well-being)	Deficient	Significant relationship between IL & sense of well-being. Personal factors related to IL: demographics, economic, social-relational
13	Monteiro, A. and Leite, C. (2021)	Portugal	college students	March 20th – April 22nd	DL: skills, use, opportunities & obstacles	Measuring ML	Satisfactory (data editing skills) Deficient (create & develop new digital solutions)	Almost widespread mastery of search data editing skills & lesser ability to create, develop new digital solutions. Technologies (before pandemic) used for institutional communication rather than development of networking and lifelong learning skills
16	Peciuliauskiene, P. (2022)	Lithuania	pre-service teachers	May – June 2021	Information search VS information literacy: ICT self-efficacy in teaching	Measuring ML	Deficient (evaluation literacy) Sufficient (information search literacy)	Perceived information and evaluation literacy: strong indirect impact on teachers' ICT self-efficacy. Information search literacy: strong direct impact on teachers' ICT self-efficacy in teaching
17	Purnama, S. (2021)	Indonesia	Primary school students & parents	Sept. – Dec. 2020	DL & online risk @ primary schools	ML as moderator (online risks @ primary school)	Limited (safe media use)	Online risks mediated by DL, parental mediation & self-control. Parental mediation failed in promoting students' self-control
18	Su, Y. *et al.* (2022)	USA	general public, 18+	April 2020	Infodemic & misperceptions about COVID: social media use, homogeneous online discussion, self-perceived ML	ML as moderator (infodemic & misperception about COVID)	Limited	Social media use positively associated with misperceptions about COVID. Homogeneous discussion positive moderator of social media use & misperceptions about COVID. ML as a positive mediator in this process
19	Su, Y. *et al.* (2021)	China	media users, 18+	Mar. 3rd – April 18th	ML factors on misperceptions & COVID infodemic	ML as moderator (misperception about COVID)	Limited (locus of control over media & need for cognition (NFC)	Among those with greater locus of control over media: the association between social media information seeking & COVID-19 misperceptions become more positive; the association between NFC and COVID-19 misperceptions become more negative

20	Taskin, B. and OK, C. (2022)	Korea	general public, 18+	2019 & 2020	Life satisfaction: DL & problematic smartphone use (PSU)	ML as moderator (PSU)	Limited (PSU)	Impact of DL & PSU on life satisfaction was greater after COVID-19. Further education is needed to improve DL in schools and communities
21	Tejedor, S. *et al.* (2020)	Spain, Italy Ecuador	college students	March – April 2020	DL & higher education	Measuring ML	Limited	Need to strengthen digital skills & teaching methodologies; adapt communication channels between universities, teachers & students
25	Voda, A. *et al.* (2022)	Romania	college students	March – May 2021	DL skills: comparison between social science & humanities students	Measuring ML	Limited (level & field of study)	Communication & critical thinking, problem solving & technical skills prevalent in social science students; creativity & IL prevalent in humanities students. Except from problem solving & creativity, digital skills are influenced by diff. levels of study

1. Conceptualization of media literacy

The first research question that guided this systemic evidence review addressed issues related to the conceptualization and operationalization of a media literacy. Here, the goal set for a systemic review of current empirical evidence was to gain a better understanding of what exactly the term "media literacy" refers to when putting it into practice. The review was also meant to analyse the strategies and methods that researchers apply to measure media (or related) literacies. As mentioned earlier, linked to problems of definition are issues of measurement and operationalization. Media literacy has indeed, never been easy to measure when assumed either as skills, knowledge, attitudes, values, behaviours or policies. Confusion also arises when the empirical methods used aim at evaluating certain competences through performance tests, task-based assessments or are designed to collect self-reported data about efficacy on specific competences, behaviours or skills. The lack of specification about these standards render measurement and evaluation very complex. Plus, comparisons and dialogue among different conceptual frameworks becomes very difficult when definitions and research designs differ on meanings and ground.

Table 2 shows ample diversity on the literacies under scrutiny. While it might not come as surprise (i.e., Potter, 2022) how diverse the definitions of media literacy in general or specific literacies (i.e., digital literacy, information literacy, functional literacy, media education, digital competence, media locus of control, self-efficacy) are used throughout the empirical evidence reviewed, it is striking how the umbrella of the term *literacy* stretches across diverse areas of study until it inevitably loses accuracy.

In part, as explained earlier, this is because the systematic review here conducted draw on a broad use of the term when seeking for current empirical evidence implied a combination of multiple media literacies such as: information literacy, digital literacy, news or information literacy, as well as specific medium literacies such as social media literacy or smartphone use literacy. As mentioned before, the goal of this search strategy was to be inclusive of different approaches and disciplines, but also to assess the lack of an overreaching conceptual framework across such a diverse and ample areas of study.

Table 2. Identified approaches to media literacy

Study #	Reference	ML: multiple literacies, definitions & approaches
2	Aslan, S. (2021)	Digital literacy (DL): Awareness, attitude and ability to use digital tools so as to identify, access, manage, integrate & create new information using metacognitive skills […] Ability to access, produce and share accurate info and use technology in the learning-teaching processes along with using different technologies properly (p. 56). *Individual characteristics*: creative, innovative; able to cooperate, communicate, think critically, solve problems, have decision-making skills, know & use technological concepts; someone that do what is needed as digital citizen (p. 57). *DL self-efficacy*: individuals' belief in choosing technological tools to meet goals, knowing, organizing, using & developing these tools' features. High DL self-efficacy: knowing which technological tools should be used for what purpose, & trying to recognize and solve technological challenges; cope with problems while using technology & developing different solutions (p. 58).
3	Belvoncikova, E. and Ciderova, D. (2022)	Media literacy (ML): ability to apply reading, writing & numerical skills as the fundamental requirement for learning & daily livelihood in society; synergy of literacy & multiple intelligences (i.e.: informative, media, cultural literacy). *Functional literacy*: applied literacy through comprehension of texts of figures […] Acquiring and improving *literacy* skills throughout life as an intrinsic part of the right to education; literacy is a driver for sustainable development as it enables greater participation in the labour market; improves child & family health and nutrition; reduces poverty & expands life opportunities (p. 55).
4	Hoobs, R. *et al.* (2022)	Because of the range of terms & concepts that are in circulation (news literacy, information literacy, visual literacy, digital literacy, etc.), many local stakeholders may lack a coherent understanding of what ML education consists of in practice […] State laws [and educational policies at the local, state & national levels] can be powerful levers of change that enable ML education to thrive […] With or without the presence of state laws, implementing ML education into schools requires support from multiple stakeholders. Classroom teachers in all grade levels & content areas have been shown to integrate ML learning activities such as analyzing and creating media as cross-curricular skills. Library media specialists help students develop competency in news literacy and IL. School administrators can play a key role in overcoming the obstacles & limitations perceived by teachers. Community members from media & technology organizations support ML initiatives when they align with their values and in the community, ML education can be seen as a civic responsibility where contributions from public officials and public librarians are important. Parents also have a role to play in ML education in the home because ML is a part of everyday life […] Due to the need for periods of isolation with hybrid instruction at home, in many communities, parents also got a much closer inside look into what their students were learning during COVID (pp. 2–4).
6	Igbinovia, M. *et al.* (2020)	*Information Literacy* (IL) could be regarded as the ability to critique and judge the efficacy of any retrieved information before putting it to use […] With IL, people are able to fully engage society with informed views as well make sound decisions (p. 2). *Information Literacy Competence (*ILC): connotes a set of skills that are required to explore information from various sources to meet certain needs; it constitutes knowledge established from a given set of instructions to expedite and motivate a learning process […] As defined by the Society of College, National and University Libraries (SCONUL, 2011), requires an understanding of how information and news is gathered, used, managed. 7 pillars of SCONUL's ILC model: (1) ability to identify a need for information; (2) assess current knowledge & identify gaps; (3) construct strategies for locating information & data; (4) locate & access the information & data needed; (5) evaluate information & data; (6) ethically organize information; and (7) apply the acquired knowledge in an ethical way (p. 2).
9	Krelova, K. *et al.* (2021)	DL*:* skills such as critical algorithmic thinking, problem solving, collaboration & creativity […] Digital competences include not only technical abilities, but also relevant knowledge & attitudes; the development of cognitive skills, technical abilities & attitudes (p. 132). *Different literacies*: computer, information, media, communication and cooperation literacies; digital working environment; ability to learn (p. 133). Dual pressure on the development of digital competences: one being universal, objectively stemming from the current technological development of society and the other specific, connected with extraordinary situations; currently the crisis impacts of the epidemiological situation in society, requiring a switch to online forms of teaching (p. 131).
10	Li, Q. *et al.* (2022)	The vital role of ML in promoting citizens' political participation & enhancing their right to information […] Enhancing the public's ML will help to strengthen their interest and understanding in joining the discussion of political issues, thus increasing individuals' level of trust in the government's ability to do so […] In public health emergencies, increased proxy efficacy helps the public adopt scientific responses; ML role in enhancing agent efficacy can help the public adopt more scientific strategies when encountering the epidemic (p. 2). *Proxy Efficacy and Self-Efficacy*. Efficacy is defined as an individual's perceived ability to control aspects of her life. Self-efficacy emphasizes one's perception of herself, while proxy efficacy emphasizes the perceived ability to control a certain proxy (e.g., teachers, churches, and government). It should be noticed that the relationship between self-efficacy and proxy efficacy is not exclusive but an interactive one (p. 2).
11	Linde-Valenzuela, T. *et al.* (2022)	DL requires a transition from traditional, modes of accessing information to the dynamism of fluid information, constantly changing that is available with ICTs as ML is essential for citizens to acquire digital competence (DC) (p. 2). *DC*: capacity to know, access & use the services made available to citizens, in addition to reading and understanding information in multimedia format, relating information and reusing it to generate new knowledge (p. 3).
12	Lund, B. and Wang, T. (2022)	DL: the ability to use information & communication technologies to find, evaluate, create and communicate information, requiring both cognitive and technical skills (American Library Association's Digital Literacy Task Force, 2020) […] Children are often the focus of digital literacy research; this generation ("Gen Z") is considered "digital natives" or individuals who grow up in the digital age & used digital technologies daily. Older adults, conversely, are not digital natives & have often been overlooked in discussion of importance of DL concepts.

13	Monteiro, A. and Leite, C. (2021)	*Three levels of DL:* (1) DC: prerequisite for DL & involves everything from simple skills, such as using a keyboard, to more critical, evaluative and conceptual approaches, including attitudes & awareness about own learning & about the relationship with peers and the role of the digital media environment in order to live in society. (2) Digital use: the application of digital skills in a professional context or in a specific knowledge domain. (3) Digital transformation: achieved when the use of digital technologies provides innovation & creativity promoting significant changes in the professional field or in a conceptual domain DL many literacies: computational; information literacy; visual literacy; ML; among others *Elements of DL:* · Access: knowing about & how to collect and/or retrieve information · Manage: applying an existing organisational or classification scheme · Integrate: interpreting & representing information (summarising, comparing, and contrasting) · Evaluate: making judgments about the quality, relevance, usefulness, or efficiency of information · Create: generating information by adapting, applying, designing, inventing, or authoring information · Communicate: communicating information persuasively to meet needs of various audiences through use of an appropriate medium. For teachers: *Digital Competence of Educator* (6 areas; 22 competences) (1) Professional engagement: organizational communication; professional collaboration; reflective practice; digital competence (2) Digital resources: selecting, creating & modifying, managing, protecting, sharing (3) Teaching and learning: teaching, guidance, collaborative learning, self-regulated learning (4) Assessment: analyzing evidence, feedback & planning (5) Empowering learners: accessibility & inclusion; differentiation & personalization; actively engaging learners (6) Facilitating learners' digital competence: information & ML; communication; content creation; responsible use; problem solving
16	Peciuliauskiene, P. (2022)	*Information Literacy* (IL): set of abilities requiring individuals to recognize the need for information & have the ability to locate, evaluate & effectively use the information. 5 components of IL (Library Association, 2000, p. 1): (1) determine the nature & extent of the information needed; (2) search & accesses needed information effectively and efficiently; (3) evaluate information & its sources critically; (4) use information effectively to accomplish a specific purpose; (5) understand many of the economic, legal & social issues surrounding the use of information & accesses Four categories of IL (p. 8): (1) information search (abilities to find, access & work with information; closely related to ICT abilities, p. 3) (2) information evaluation (being able to gather, process, understand & critically evaluate information, p. 6) (3) information processing (4) information dissemination *Self-efficacy*: Individuals' perceptions and beliefs regarding their thoughts and actions determining thoughts, feelings, self-motivation and confidence. Directly related to teachers' motivation to work.
17	Purnama, S. (2021)	DL: ability to discover, evaluate, utilize, share & utilize information technology and the internet (p. 4) […] Capability to gain an understanding from resources in the computer & the internet closely linked with cognitive abilities. In addition to learning involvement, online learning activities also enable students to engaging in social media, playing games & listening to music […] Insufficient DL causes low self-control that can lead to deviations in the cyber-world. Low DL skills can also result in children becoming addicted to using gadgets […] DL can indicate online behavior in children, including in terms of self-control; know their responsibilities when, where, and for how long they can access online learning independently […] Individual's DL level can affect students' performance in facilitating the use of e-learning & reducing the negative impact from online activities (p. 2).
18	Su, Y. *et al.* (2022)	ML: one's practice & ability to decode, understand, assess & critically analyze media content […] It is not only about the development & polishing of a skill set, but it is more about understanding media operations, patterns in the message content & the impacts of the media. *Self-perceived ML* (SPML): peoples' perceptions of how media-literate they are & therefore, how well they think they are capable of decoding, understanding, assessing, or critically analyzing media content; to measure mindful processing & belief in one's ability to control media content they consume when investigating ML […] The measurement of SPML is considered beneficial to improve the conventional ML operationalization […] To become media-literate, individuals need to feel in control of their media consumption & the media's influence on them to become media literate.
19	Su, Y. *et al.* (2021)	ML: critical skill set that helps individuals efficiently navigate through the digital environment (p. 3); positive association between need for cognition (NFC) and media locus of control (MLofC) […] NFC as one of the subcategories of the broader domain of ML […] People high in NFC are more likely to analyze information at hand critically using more information skills. NFC positively predicts critical thinking about information sources so that people avoid blindly consuming information. A higher level of NFC helps individuals to gain more self-efficacy in information consumption. NFC also promotes skepticism about social media information, which in turn stimulates more media literate behaviors such as fact-checking (p. 3). *Need for cognition:* capability to critically analyze each piece of information; […] an internal immunization toward misinformation (p. 2); stable personality trait describing individuals' tendency to engage in and enjoy media […] Individuals high in NFC tend to mindfully process information encountered via an analytical approach that is active, conscious, effortful, logical, intentional & therefore, more comprehensive. Individuals low in NFC, however, are (1) more likely to rely on the heuristic processing approach that requires less cognition effort to make sense of new information; (2) more likely to suffer from information overload than those high in NFC (p. 3). *Media locus of control* (MLofC): ability to control one's media environment […] People with higher MLofC encounter and consume media under own controls while those with lower MLofC tend to find it difficult to rely on consumptive curatorial efforts to circumvent the content they don't like & consume what they expect […] In a nutshell, MLofC speaks to the extent to which individuals perceive themselves as being in control of news.

20	Taskin, B. and OK, C. (2022)	DL: ability to search, evaluate, organize & perform tasks through digital equipment & the internet in learning, work, and social life (p. 1311) […] Allows the construction of new communication & interaction realities, resulting in a positive contribution to life situations. […] It positively impacts education with the remarkable rise of electronic learning. With the advancement of technology, schools, colleges, and other institutions have introduced digital learning to allow students to attend classes through digital technologies (p. 1312). *Problematic Smartphone Use* (PSU): decline in the ability to regulate use & cause of excessive dependence; lack of tolerance, withdrawal, space & craving (p. 1311). Unlike DL, which functions positively for the spread of an online society, PSU negatively impacts life satisfaction […] PSU is a form of psychological disorder characterized by behavioral dependence on smartphones, including other forms of digital media such as social media and the internet. The addictive nature of smartphones influences certain people to use them excessively without control & at the expense of other duties (p. 1312).
21	Tejedor, S. *et al.* (2020)	ML: a concept embracing all the fields and all the competences related to media (p. 2). DL: constitutes the basis for citizenship in order to be effective & efficient in the 21st century professional and personal lives […] The acquisition of the technical competence for using information and communication technologies in addition to the acquisition of the basic practical & intellectual capacities for individuals to completely develop themselves in the information society […] DL may be understood as an interrelated set of skills or competencies necessary for success in the digital age, developed and evolved in different dimensions address in models acknowledge by countries and governments (p. 2) […] It should be understood as an inter-related set of skills or competencies necessary for success in the digital age. In particular, the so-called critical approach has been growing, mainly with the spread of media literacy studies (p. 3). Four dimensions of DL (p. 5): (1) Teacher 's professional engagement & collaboration: professional engagement, the capability to integrate organizational comm., professional collaboration & effective practice and development (4 variables). (2) Digital learning & sources: rethinking of conventional sources of learning & complementing the development of other dimensions. The necessity for citizens to be aware of how to responsibly use, access, and manage digital content (6 variables). (3) Teachers guidance & skills: learning strategies will definitely develop an appropriate DL by designing, planning & implanting in the different stages of learning digital tools & technologies (5 variables). (4) Supporting/empowering students: related to the development of DL; access to digital learning resources & activities, but also empowering learners & fostering their digital competences (5 variables).
25	Voda, A. *et al.* (2022)	DL: mandatory abilities at any higher education level; fundamental ingredient in successful professionalization. [It] offers a set of transversal skills that could improve a whole area of activities, from banking operations to civic participation […] Contemporary people must be digitally literate in a complex manner: not only in using digital tools, but in selecting the right ones & interpreting them correctly. Access to information is a necessary condition but not a sufficient one for acquiring knowledge. Technical skills are just a part of the skills that DL encompasses; selection, critical thinking, problem-solving & creativity exemplify the tremendous variety & sophistication of DL. Digital skills also contribute to the emergence of a better EU citizen, more democratically engaged & with a better grasp of contemporary media cultures (p. 2).

The fact of the matter is that research and practice on media literacy has long passed a parsimonious understanding and as Brown stated decades ago, media literacy do mean too many things to too many people (Brown, 1998). While comprehensible, approaching media literacy as a key resilient strategy facing the current digital environment within such an ample range of meanings keeps being problematic for researchers, practitioners and policy makers at least for three reasons.

First, in all studies reviewed, the evidence offers empirical support for the promotion and strengthening of media literacy. Nevertheless, the diversity of conceptual and practical approaches to literacy —be it media, digital or information literacy— makes it hard to identify with certain sense of clarity what exactly needs to be strengthened (i.e., policies as stressed in studies #4, #17, #10; technical skills, in studies #11 and #16; attitudes or motivations in study #19; teaching strategies in study #16 and #10; behaviours in studies #12 and #20). More worrying, a lack of precision about how to implement certain strategies to strengthened media literacy (i.e., with more teaching: studies #16, #13, ,#3, #10, #20, #21; technical proficiency and practice in studies #2, #3, #9, #11, #12, #25; deliberation or regulation in studies #4 and #18) leads to vague or too ambitious goals. This absence of accuracy makes it more difficult for practitioners and policy makers to grasp a clear orientation as to what measures and policies need to be implemented in order to promote and improve media literacy.

Second, this ample breadth of meanings about media literacy also diffuses the

responsibility as to who is in charge of improving and strengthening media literacy. For instance, some studies identify that the responsibility of improving media literacy among college students resides on specific institutions or actors (i.e., schools in studies #4 and #17; teachers in study #16; and parents in study #17) or on informal practices (in studies #11 and #12), while others take a more holistic approach where responsibility is shared between micro, meso and macro level actors (i.e., study #4).

Third, while research stresses the benefits of promoting media literacy, fewer studies set the limits of media literacy such as the applicability or outcomes of those skills, competences or practices. This is, specific knowledge about media processes (i.e., information or digital technologies) or competences and skills (i.e., searching or evaluation strategies) are not necessarily applied in practice. This might be due to individual characteristics (i.e., motivations in study #19 or lack of agency #10); contextual characteristics, social or cultural processes (i.e., in study #21). This is, as previous research has shown (i.e., Livingstone, 2004a), media literacy is not just a matter of individuals' training, technological or critical competence. Inevitably, literacy, is a process shaped by cultural and contextual characteristics.

2. Media literacy as practice

All the 16 studies here reviewed measure media literacy on populations that have certain formal training on literacy or experience with media mainly through everyday activities (e.g., using social media or news platforms). From this stance, access to media or basic literacy skills are commonly taken for granted as research tends to focus on specific aspects of literacy (i.e., self-efficacy: in studies #2, #10 and #16; information literacy, search and evaluating literacy in studies #13 and #16) among populations that have at least, basic technical or information knowledge (e.g. teachers in training or college students) and are in constant interaction with media.

This general sense of granted access to digital platforms and information may be associated with the time frame set for the review. During COVID-19 pandemic, social interactions were translated to the digital environment making access to and use of media almost a sine qua non condition. For instance, study #13 found an almost widespread mastery of search and data editing skills among university students. These are developed through the recent long-distance learning, the need to perform academic tasks and assignments using digital technologies, as well as through specific curricular units that contribute to the development of digital skills. Relatedly, while evaluating information literacy competence in curtailing fake news about the COVID-19 among undergraduates, study #6 finds that the major causes of misinformation was not a lack of information literacy, but too much digital information circulating making it almost impossible to discern or spot fake news from verified and authentic news. Nevertheless, under controlled academic environment (e.g., specific media literacy curricular courses) the authors also found that undergraduates can define and articulate the nature and extent of their information needs.

During COVID-19 pandemic, the evidence gathered in this review shows, for instance,

that for college students (especially those whose areas of studies are related with information and technology), access and use of digital technologies occur on regular basis. While this finding might not replicate all over the world, especially in low income countries, it might suggest that key challenges for media literacy at university level might not be now related to access, but to other key components of media literacy such as evaluation and content creation.

For instance, study #3 found that college students are well awarded of the role that communication processes (i.e., searching and sharing information) play in the current digital environment, but are less aware about the measures or processes that lead to strengthen digital literacy. Similarly, study #13 found that college students show almost widespread mastery of search and data editing skills and lesser ability to create and develop new media content or explore alternative strategies to cope with information flows. In this study, evidence point to some expertise on technical knowledge, but limited use of critical thinking or creative engagement with digital media. When the searchlight is placed on teachers in training, study #16 found that the use and self-efficacy on ICT is more indirectly influenced by teachers' perceived information search literacy and less than by information evaluation literacy. This is, teachers in training feel more confident searching information on ICTs than evaluating the reach and limits of these sources.

IV. Conclusion

To advance understanding of the scope and reach of media literacy facing the current digital environment, a systemic review of current empirical evidence was conducted during the peak of the COVID-19 pandemic (March 2020 to January 2023, when the search was conducted). The aim of this systemic evidence review was to have a fresh and informed look of what exactly the term media literacy refers to and how this complex concept and "resilient strategy" was put into practice in times when it was (it is) so desperately needed.

The review shows first and most clearly, that while media literacy is a fashionable slogan when thinking about post-pandemic resilience strategies against the dangers of the digital environment, *literacy* —be it media, digital or information literacy or specific medium literacy such as social media literacy— is a concept that remains very difficult to describe and a practice that faces several challenges. As a concept, approaches to media literacy differ greatly at different levels of analysis where disciplines, goals and evidence greatly vary among countries, institutions and programs. As a practice, the stake and reach of media education acquire different meanings among, institutions (e.g., policy makers, education managers, regulators), promoters (e.g., researchers, teachers, parents) or targeted populations (students, teachers, professionals in different areas of expertise).

Second, despite different and continuous efforts, practically all over the globe, media literacy runs low around different types of demographics. This is, there is indeed much to be done at least in terms of strengthening media literacy. The challenge rests on identifying with certain sense of clarity key strategies to reach specific goals. For

instance, while some studies point to more formal training (i.e., studies #3, #10, #13, #20, #21), others recognize the role that regular use specially outside formal settings plays on gaining more confidence and experience when navigating the current digital environment (i.e., study #12). Some studies place the searchlight on technical proficiency (i. e., #2, #3, #9, #11, #16), while others emphasize individual and contextual factors that shape media literacy (i.e., #10, #19).

Third and closely related to the previous point, media literacy is not a one-off act, but a dynamic social process. As previous research has long stated, available empirical evidence is too heterogeneous and derive dubious conclusions of media literacy effectiveness. This is, the findings here reviewed suggest that numerous assumptions are made about the nature and scope of media literacy that need to be addressed both theoretically and empirically. The current digital environment might have put media literacy, especially information and digital education, as protagonists. But to fully embrace the challenges ahead, recent empirical evidence suggests that it is necessary to move beyond the predominant view of media literacy as a set of competences aimed to armor students (teachers, parents, practitioners, regulators and so on) against digital risks or as technological basic toolkits to successfully face the power and the speed of change on digital technologies. The big task rest on recognizing the context of these transformations, as well as on critically evaluating the reach and limits of media literacy as transformative tool.

This is, in the face of multiple concerns about the current state of the digital environment, the evidence review presented here shows that great expectations about the transformative power of media literacy tend to clash with the actual reach and limits of specific strategies. More common than not, these efforts are constrained by individual characteristics and contextual factors that are rarely taken into consideration when deploying great ambitions around media literacy. In this regard, too ambitious plans to use media literacy to combat (expectantly all of) the risks embedded on the digitization of society might render limited outcomes. Policy interventions might benefit from targeted and context-bounded strategies. Last but not least, while this study covers a very limited period of time (from March 2020 to January 2023) future research could extend this time frame to tests the lessons (yet to be learnt) from COVID-19 pandemic in searching for common conceptual and practical approaches to media literacy.

Conflict of Interests

The author declares no conflict of interests.

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