cogitatio

Media and Communication
2025, Volume 13, Article 8901
https://doi.org/10.17645/mac.8901

Review

Fostering Media Literacy: A Systematic Evidence Review of Intervention Effectiveness for Diverse Target Groups

Leen d'Haenens[1], Joyce Vissenberg[2], Marit Puusepp[3], Natalia Edisherashvili[4], Diego Martinez-Castro[5], Ellen Helsper[6], Lukasz Tomczyck[7], Tania Azadi[8], Sylwia Opozda-Suder[9], Erika Maksniemi[10], Guna Spurava[11], Katariina Salmela-Aro[12], Niina Sormanen[13], Sini Tiihonen[14], Terhi-Anna Wilska[15], Lauri Hietajärvi[16], Gemma Martinez[17], Nekane Larrañaga[18], Maialen Garmendia[19], Rubén Olveira Araujo[20], Verónica Donoso[21], Margus Pedaste[22], Dominika Sepielak[23]

[1] Media Culture & Policy Lab, KU Leuven, Belgium; Email: leen.dhaenens@kuleuven.be; ORCID: https://orcid.org/0000-0001-7847-9996

[2] Media Culture & Policy Lab, KU Leuven, Belgium; Email: joyce.vissenberg@kuleuven.be; ORCID: https://orcid.org/0000-0002-3211-7612

[3] Institute of Education, University of Tartu, Estonia; Email: marit.puusepp@ut.ee; ORCID: https://orcid.org/0000-0003-3366-0526

[4] Institute of Education, University of Tartu, Estonia; Email: natalia.edisherashvili@ut.ee; ORCID: https://orcid.org/0000-0002-2682-955X

[5] Media and Communications Department, London School of Economics and Political Science, UK; Email: D.F.Martinez@lse.ac.uk; ORCID: https://orcid.org/0000-0002-3040-6293

[6] Media and Communications Department, London School of Economics and Political Science, UK; Email: E.J.Helsper@lse.ac.uk; ORCID: https://orcid.org/0000-0002-0852-2853

[7] Institute of Education, Jagiellonian University in Kraków, Poland, Email: lukasz.tomczyk@uj.edu.pl; ORCID: http://orcid.org/0000-0002-5652-1433

[8] Media Culture & Policy Lab, KU Leuven, Belgium; Email: tania.azadi@kuleuven.be; ORCID: https://orcid.org/0000-0002-6731-0797

[9] Institute of Education, Jagiellonian University in Krakow, Poland; Email: sylwia.opozda@uj.edu.pl; ORCID: https://orcid.org/0000-0002-4891-7075

[10] Department of Education, University of Helsinki, Finland; Email: erika.maksniemi@helsinki.fi; ORCID: https://orcid.org/0000-0002-2413-5095

[11] Faculty of Information Technology and Communication Sciences, Tampere University, Finland; Email: guna.spurava@tuni.fi; ORCID: https://orcid.org/0000-0001-5323-9806

[12] Department of Education, University of Helsinki, Finland; Email: katariina.salmela-aro@helsinki.fi; ORCID: https://orcid.org/0000-0003-1901-4712

[13] Department of Social Sciences and Philosophy, University of Jyväskylä, Finland; Email: niina.e.sormanen@jyu.fi; ORCID: https://orcid.org/0000-0003-2336-9655

[14] Department of Social Sciences and Philosophy, University of Jyväskylä, Finland; Email: sini.s.p.tiihonen@jyu.fi; ORCID: https://orcid.org/0009-0007-9632-6169

[15] Department of Social Sciences and Philosophy, University of Jyväskylä, Finland; Email: terhi-anna.wilska@jyu.fi; ORCID: https://orcid.org/0000-0001-7516-7356

[16] Department of Education, University of Helsinki, Finland; Email: lauri.hietajarvi@helsinki.fi; ORCID: https://orcid.org/0000-0003-2149-9237

[17] Department of Communication, University of the Basque Country, Spain; Email: gemma.martinez@ehu.eus; ORCID: https://orcid.org/0000-0001-6463-4238

[18] Department of Sociology and Social Work, University of the Basque Country, Spain; Email: nekane.larranaga@ehu.eus; ORCID: http://orcid.org/0000-0002-8062-3544

[19] Department of Sociology and Social Work, University of the Basque Country, Spain; Email: maialen.garmendia@ehu.eus; ORCID: https://orcid.org/0000-0001-7268-4286

[20] Department of Audiovisual Communication and Advertising, University of the Basque Country, Spain; Email: ruben.olveira@ehu.eus; ORCID: https://orcid.org/0000-0003-4797-8746

[21] Media Culture & Policy Lab, KU Leuven, Belgium; Email: veronica.donoso@eun.org; ORCID: https://orcid.org/0000-0003-0478-9881

[22] Institute of Education, University of Tartu, Estonia; Email: margus.pedaste@ut.ee; ORCID: https://orcid.org/0000-0002-5087-9637

[23] Department of Education, Jagiellonian University in Krakow, Poland; Email: dominika.sepielak@doctoral.uj.edu.pl; ORCID: https://orcid.org/0000-0002-4302-2520

Correspondence: Tania Azadi (tania.azadi@kuleuven.be)

Submitted: 3 July 2024 | Accepted: 24 September 2024 | Published: in press

Issue: This review is part of the issue “Evaluating and Enhancing Media Literacy and Digital Skills” edited by Leen d’Haenens (KU Leuven) and Willem Joris (Vrije Universiteit Brussel), fully open access at https://doi.org/10.17645/mac.i466

Abstract

Investigating the effectiveness of media literacy interventions is essential to identify the most promising programmes. This 2022 systematic evidence review, guided by the PRISMA guideline, aimed to collect and synthesize scientific evidence on effective media literacy intervention programmes across different target groups and the used frameworks. A comprehensive search across major scientific databases (Web of Science, Scopus, ProQuest, Communication & Mass Media Complete, and Education Resources Information Centre) and rigorous screening and coding processes identified 119 studies on media literacy intervention effectiveness and outcomes. This review offers valuable insights into the current state of media literacy intervention research, emphasizing the importance of considering diverse target groups and exploring a wide range of outcomes to enhance our understanding of these interventions' impact.

Keywords

Media literacy; impact assessment; interventions; outcomes; systematic review

1. Introduction

In today's digital era, characterized by an abundance of information and rapid technological advancements, the ability to critically navigate and adequately use media and digital content is crucial. While scholars propose varying definitions of media literacy, there is consensus that it involves specific knowledge and skills facilitating critical comprehension and use

of media (Hobbs, 1999; Jeong et al., 2012; Marten, 2010; McCannon, 2009). Media literacy, broadly defined as the ability to access, analyze, evaluate, and create media content, inherently includes digital skills. Digital skills—such as competencies in using digital devices, platforms, and tools—are a key subset of media literacy. Together, they equip individuals to navigate the digital media landscape effectively, enabling informed decision-making and protection against misinformation and digital threats (Helsper et al., 2020)

A media literacy intervention is an educational approach designed to enhance critical thinking by improving knowledge of media, raising awareness of media influence, and honing the ability to assess media representations (Byrne, 2009). These interventions aim to develop individuals' skills to understand media messages, recognize biases, discern credible sources, and understand media effects on individuals and society. Similarly, digital skills interventions focus on empowering individuals with the ability to effectively and safely use digital technologies (Alon et al, 2024). Media literacy, as a broad concept that includes digital skills, combines the ability to critically understand media content and use digital tools effectively. To enhance these skills, various interventions have been implemented in educational, community, and organizational settings, helping diverse populations develop these important competencies.

Theories are a key element of these interventions, as they allow for the precise implementation of pedagogical, andragogical, and geragogical experiments (Passey, 2020). Such theories facilitate the design and implementation of interventions that shape media literacy. Although theories are a valuable and informative foundation for researchers to build and design media literacy interventions, research attest that interventions did not always contain explicit theoretical frameworks that allow for the definition of variables or the interpretation of research findings (Jeong et al., 2012).

Existing systematic reviews and meta-analyses have explored various outcomes of media literacy interventions, focusing on both cognitive and behavioral dimensions. Early work, such as Bergsma & Carney's (2008) systematic review of health-promoting media literacy, assessed the effectiveness of interventions aimed at improving knowledge and attitudes towards health-related content. More recently, Polanco-Levicán & Salvo-Garrido (2022) expanded the scope of media literacy to include social media literacy, emphasizing competencies related to the evaluation and critical consumption of social media content. Both studies contribute to understanding media literacy in specific domains but leave gaps in terms of evaluating the broader impacts of media literacy interventions across diverse contexts and populations. Vahedi et al. (2018) and Xie et al. (2019) provide more recent meta-analyses, extending beyond the work of Jeong et al. (2012). Vahedi et al. (2018) focused on adolescents' risky health behaviors, concluding that media literacy interventions can change attitudes and intentions regarding health risks. Xie et al. (2019) examined media literacy interventions in the context of deviant behaviors, further highlighting the role of tailored media literacy programs in behavior modification. Both studies underscore the need for interventions that specifically target behavior-related outcomes, yet they do not fully address how these programs work across different demographic groups or in diverse settings.

Previous research has categorized media literacy outcomes into several dimensions, such as knowledge of persuasion, advertising (Buijzen, 2007; Hobbs & Frost, 2003), critical thinking (Austin & Johnson, 1997; Austin et al., 2005), and media influence recognition (Scull et al., 2017, 2019). Behavioral outcomes, such as changes in attitudes, self-efficacy, and social norms, are also critical (Fishbein & Yzer, 2003). However, as noted by Jeong et al. (2012), media literacy interventions tend to have a stronger effect on media-related outcomes than on behaviors. This finding is supported by studies on practical competencies in digital skills (Haddon et al., 2020; Livingstone et al., 2021), which emphasize the need for integrating safe digital practices into media literacy programs. Despite the valuable contributions of these reviews, there remains a gap in understanding the effectiveness of media literacy interventions across diverse populations. Much of the research, as Edwards et al. (2021) note, focuses on adult participants, with limited attention to minors, youth, or other vulnerable groups. Furthermore, findings rarely account for demographic factors like ethnicity, disability, or socioeconomic status, which are crucial for addressing digital inequalities. Research by Ayala & Elder (2011) shows that interventions not tailored to specific target groups often fail to meet their objectives, emphasizing the importance of designing programs that account for the experiences and needs of diverse populations.

The present review addresses these gaps by systematically evaluating media literacy interventions across multiple contexts, with a particular focus on the inclusion of diverse and vulnerable groups. By assessing empirical studies published between 2012 and 2022, this review builds a robust evidence base on the outcomes of media literacy interventions and identifies the characteristics of successful programs. This research aims to inform the design, implementation, and evaluation of future interventions, offering insights into the broader societal implications of media literacy, including its role in addressing digital inequalities, misinformation, and digital citizenship. Accordingly, the present systematic evidence review was conducted with the following objectives: 1) To build a robust evidence base on the outcomes of media literacy interventions; and 2) To

identify the characteristics of potentially effective media literacy intervention programmes that lead to positive outcomes across diverse contexts. The specific research questions are as follow:

1. What characteristics of media literacy intervention programs contribute to achieving positive outcomes?
2. How do variations in context influence the effectiveness of media literacy interventions?

2 Methodology

The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009), which are widely used to ensure transparency and rigor in systematic reviews. PRISMA provides a structured approach for selecting, analyzing, and reporting studies, focusing on clarity in the presentation of the search strategy, inclusion criteria, data extraction, and synthesis of findings. By adhering to these guidelines, this review ensures a comprehensive and systematic approach to analyzing media literacy interventions (See Appendix 1).

2.1 Article search and study eligibility criteria

Article search included elaborating a search phrase, identifying and searching the relevant databases and applying relevant filters to keep the search focused. The search stage started with the identification of key concepts related to the research questions. The search phrase, which incorporated a wide array of terms, was elaborated to ensure comprehensive coverage of the relevant media literacy studies. These concepts, including key words such as 1) "media literacy and digital skills," 2) "Intervention," 3) "Experimental," and 4) Terms to exclude certain studies, specifically "Medical." Each key term was paired with all possible synonyms, forming a detailed search phrase (see Appendix 2 for more details).

Using the specified search terms, articles were obtained from various databases (including Web of Science, Scopus, ProQuest, Communication & Mass Media Complete, and Education Resources Information Centre). The search was further refined using specific eligibility criteria, including publication dates between 2012 and 2022, publications in English, and sources from peer-reviewed journals or conference proceedings. The search was conducted in December 2022

2.2 Study selection

2.2.1 Inclusion and exclusion criteria

Inclusion criteria were established to screen and select relevant studies for final analysis, ensuring alignment with the research questions at each stage. The inclusion/exclusion were applied in a cascading fashion, excluding studies at each stage if they failed to meet the initial criteria.

Initially, titles and abstracts were evaluated using the first set of selection criteria, excluding studies focused solely on media use or unrelated skills. Only studies about interventions aimed at teaching, developing or stimulating media literacy and digital skills, and using quantitative methods such as experiments, quasi-experiments, or surveys, were included. Studies that did not meet these criteria were excluded. In the second stage, full texts were screened with an extended list of criteria, including quality appraisal based on Gough's (2007) Weight of Evidence framework. Studies needed clear definitions, measures, theoretical bases for media literacy and digital skills, and in-depth descriptions of interventions and their effectiveness. Only experimental or quasi-experimental methodologies comparing at least two conditions (treatment and control groups) were included. Studies also needed to address selection bias, include statistical significance testing, relevant control variables, and report main findings with effect sizes or statistical data.

The coding framework distinguished seven initial outcome categories: Civic/participatory, Economic/employment, Education/learning, Media literacy and digital skills, Physical wellbeing, Psychological wellbeing, and Socio-cultural wellbeing. This approach, shaped by a wide body of research to capture positive outcomes across various life domains, ensured that the coding framework reflected the broader range of potential impacts of media literacy interventions. The “other” option was included for outcomes not fitting these categories. Following analysis of the 'other' category, two additional outcome categories were added: Cognitive outcomes and Technology acceptance. The emergence of these categories highlights the review’s responsiveness to findings that were not initially anticipated, ensuring a comprehensive analysis rather than merely adhering to initial preconceptions. Civic/participatory outcomes include digital citizenship performance and perceptions of partisanship. Education and learning outcomes involve variables such as literacy and perceived learning. Media literacy and digital skills outcomes cover digital literacy, programming skills, and attitudes about online risks. Physical wellbeing outcomes include subjective health and attitudes towards e.g., smoking.

Psychological wellbeing outcomes consist of body image, confidence, and social comparison. Socio-cultural wellbeing outcomes involve bystander intentions and gender role norms. Cognitive outcomes encompass mental effort (e.g., processing information), flow, and self-efficacy. Technology acceptance outcomes include perceived usefulness, perceived ease of use, and user satisfaction.

2.2.2 Selection stages

The initial search across databases yielded 5,890 results. After removing duplicates and retractions, 4,878 unique results were screened. After applying the selection criteria, 119 studies were included in the final pool of studies to be reviewed (see Appendix 3 for summary of the selected studies). The whole process of screening and data on study inclusion/exclusions is captured in Appendix 1.

2.3 Reliability of screening: intercoder reliability

Six teams, each consisting of two to three coders, assessed intercoder reliability for inclusion-exclusion decisions at both the title and abstract level and the full-text level. Abstracts and articles were randomly selected from the pool of eligible articles, and Fleiss' kappa (κ) was calculated using JASP (version 0.17.1) (JASP Team, 2024). Three rounds of screening were conducted to achieve substantial agreement between coders, reaching a Fleiss' κ of 0.63, based on Landis and Koch's criteria (Landis & Koch, 1977). Notes were kept on inclusion or exclusion reasons, and after each round, team discussions resolved uncertain cases.

In the final round, 451 articles (approximately 9.2% of the total 4,878 abstracts) were screened. After the third round, all remaining abstracts were screened for full-text eligibility. To assess intercoder reliability at the full-text level, 72 articles (approximately 10.6% of the total 678 articles) were screened. The initial round yielded a substantial agreement with a Fleiss' κ of 0.79. Following thorough team discussions to resolve any differences, full-text screening was conducted on all remaining studies, resulting in 119 studies being selected for final coding and analysis.

2.4 Data collection: Coding frame for data extraction

The final 119 studies were coded and analyzed using a framework developed from literature consultations and observations during the full-text screening. This framework comprised five main sections: article information, intervention characterization, methodology, intervention outcomes, and potential drivers or enablers of the intervention effects. The article information section captured details such as authors, study title, publication name, and study/publication quality. The intervention characterization section gathered data on targeted skills, target groups, intervention procedures, and other relevant elements.

The methodology section provided information on reviewed study design, data collection methods, and sample size. The largest section, focusing on intervention outcomes, recorded the measured outcomes, including the type of effect (within-group, between-groups, or interaction) and the statistical information needed to evaluate effect size. The final section concentrated on potential drivers or enablers of intervention effects, such as mediators and moderators. Coding was performed using Qualtrics software (Qualtrics, 2022), where a questionnaire capturing the required information was filled out for each study. The completed dataset was then exported to SPSS and Excel for further analysis.

2.5 Data Analysis

In addition to descriptive analysis, the data exploration primarily involved calculating the effect sizes of the identified interventions and factors on media literacy of various target groups, using the statistical data collected from the studies.

2.5.1 Effect size calculation

Effect sizes for each outcome were gathered from the articles. When effect sizes were not reported, but other statistical information such as means, standard deviations, and sample sizes were available, effect sizes were calculated using an online calculator. The calculated effect sizes were reported as Cohen's d (Cohen, 1988), partial eta squared (Olejnik & Algina, 2003), or difference-in-difference. Effect sizes were interpreted using established thresholds (see Appendix 4 for effect sizes thresholds).

Such analysis allowed for determining the significance of the interventions' effects and assessing the reliability of their impact across various outcomes, providing a robust basis for interpreting the effectiveness of each intervention.

3 Results

The results in this section are organized into three subsections: 1) the use of theoretical frameworks in media literacy interventions, 2) the effectiveness of interventions across various outcome categories, 3) and the effectiveness of interventions across different target groups.

3.1 Theoretical frameworks

Although theories are a valuable and informative foundation for researchers to build and design media literacy interventions, 25.86% of the articles analysed did not contain explicit references to theoretical frameworks that allow for the definition of variables or the interpretation of research findings. 47.22% of the theoretical frameworks linked directly to disciplines such as media studies, media psychology, media pedagogy, and media sociology. In contrast, 52.78% were 'auxiliary' theories from other socio-humanities. The remaining 26.92% of the articles utilized general guiding grinciples i.e., instead of explicitly applying a specific theory, the articles have drawn on theoretical concepts without fully integrating or naming the framework.

The most frequently used theories were self-regulation within the context of social learning theories, the Message Interpretation Process (MIP) model, and various approaches to media literacy, each appearing in 9.72% of the articles. This was followed by the Theory of Planned Behavior, cited in 8.33% of the studies. Additionally, the Technological Pedagogical and Content Knowledge (TPCK) framework appeared in 6.94% of the articles analyzed. A full Overview of the theoretical frameworks is discussed by Vissenberg et al (2023).

3.2 Effectiveness of interventions across outcome categories

We analyzed 119 studies examining the outcomes of media literacy interventions. On average, each study measured 3.5 different outcomes. Many outcomes were assessed using scales composed of several individual measurement items. When information on a composite variable was available, it was counted as a single measured outcome. In the absence of composite variable information, each individual measurement item was counted separately, explaining the high number of outcomes reported in some studies. Additional descriptive data and information on the effectiveness of the interventions are detailed in the following subsections.

Among the 119 studies, outcomes related to media literacy and digital skills were most frequently tested. These studies assessed 364 outcomes linked to media literacy and digital skills, accounting for 53.7% of the 678 effects studied. It is worth noting that the reported 678 effects pertain to the "effects studied" rather than the "papers/articles studied." A single article may investigate multiple effects of an intervention, which is why the total number of effects examined exceeds the 119 individual studies.

Out of the 678 effects of media literacy interventions across eight outcome types, 292 (43.1%) were non-significant, 180 (26.5%) were small effects, 79 (11.7%) were medium-sized effects, and 88 (13.0%) were large effects. For 39 effects (5.8%), no effect size was reported, and insufficient information was available for calculation. Figure 1 displays the number of outcomes and the effect sizes for each of the eight outcome categories.

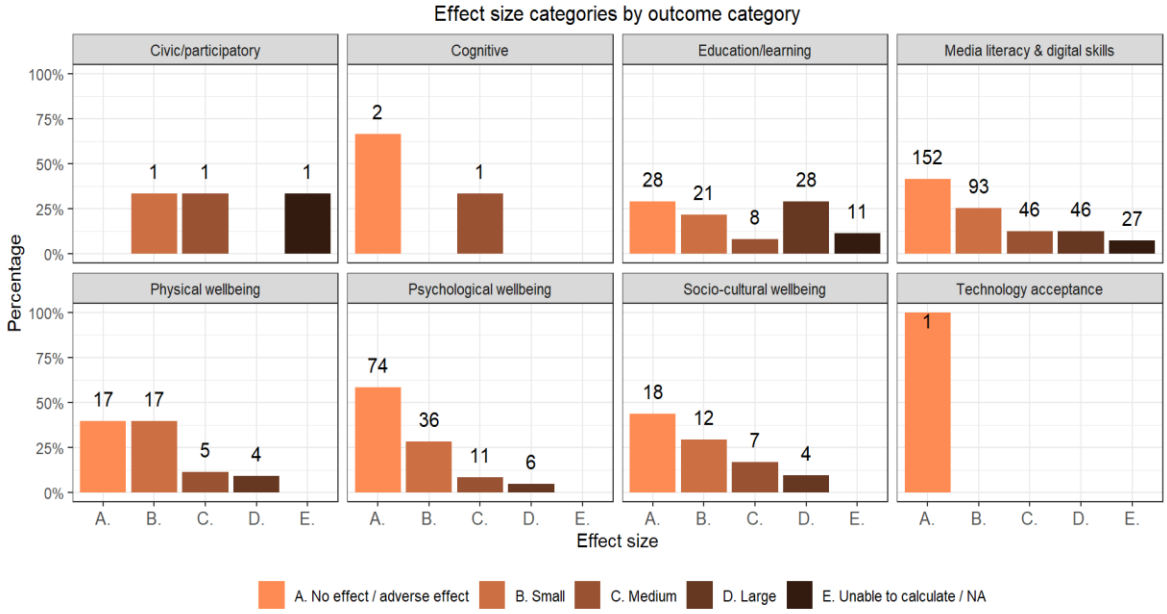

Figure 1. Effect size categories by outcome type

Outcomes related to media literacy and digital skills were the most frequently tested, with 364 outcomes assessed, accounting for 53.7% of all 678 effects studied. For 27 outcomes (7.4%), no effect size was reported, and insufficient information prevented calculation. Of the tested outcomes, 152 (41.7%) were non-significant or adverse, 93 (25.5%) were small, 46 (12.6%) were medium, and 46 (12.6%) were large.

Psychological wellbeing outcomes were the second most frequently tested, with 127 outcomes examined (18.7% of all effects). For the majority (74 outcomes, 58.3%), no significant effects were found. Small effects were reported for 36 outcomes (28.3%), medium effects for 11 outcomes (8.7%), and large effects for 6 outcomes (4.7%).

Education and learning outcomes were the third most frequently tested, with 96 outcomes assessed. For 28 outcomes (29.2%), no effects were reported. Small effects were found for 21 outcomes (21.9%), medium effects for 8 outcomes (8.3%), and large effects for 28 outcomes (29.2%). For 11 outcomes (11.5%), insufficient information was available to calculate the effect size.

Outcomes related to physical wellbeing (43 outcomes, 6.3%) and socio-cultural wellbeing (41 outcomes, 6.0%) were also tested. However, civic/participatory outcomes (3 outcomes, 0.5%), cognitive outcomes (3 outcomes, 0.5%), and technology acceptance outcomes (1 outcome, 0.1%) were considered only sporadically.

3.3 Effectiveness of interventions across target groups

The following nine target groups were defined for further analysis of intervention effectiveness (expressed through effect size): children, youths, college students, (pre-service) teachers, young adults, adults, older adults, parents, and the general public. Figure 2 presents the effects of media literacy interventions on the eight outcome types for **children**, defined as participants younger than 12 years old. Across the 119 studies, 94 effects were measured with child participants.

Most effects were measured in the media literacy and digital skills category (44 effects, 46.8%) and the education and learning category (21 effects, 22.3%). Both categories showed a high number of large effects: 16 large effects on media literacy and digital skills (36.4% of all effects in this category) and 8 large effects on education/learning outcomes (38.1%).

Fewer effects were measured for children in physical wellbeing (14 effects, 14.9%), psychological wellbeing (five effects, 5.3%), and socio-cultural wellbeing (eight effects, 8.5%). Only one effect was tested for civic/participatory outcomes (1.1%) and technology acceptance outcomes (1.1%). No effects on cognitive outcomes were tested in children.

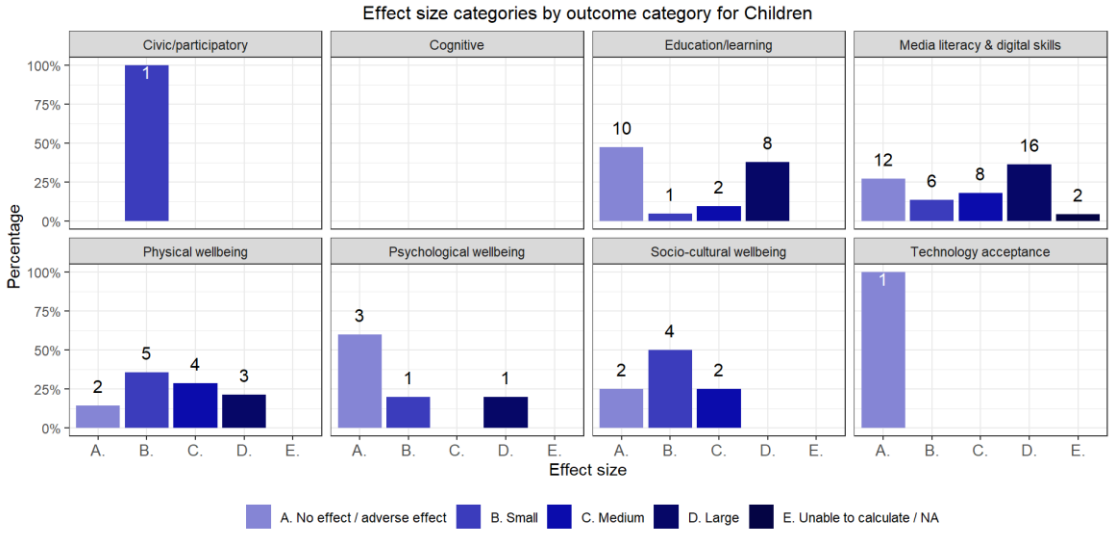

Figure 2. Effect size categories by outcome type for children

Figure 3 displays the effects of media literacy interventions on the eight outcome types for **youths**, defined as individuals aged 12 to 17, typically attending secondary education. Across the 119 studies, 290 effects were measured with youth participants. Two outcome categories were tested significantly more than others: media literacy and digital skills (141 effects, 48.6%) and psychological wellbeing (66 effects, 22.8%). While psychological wellbeing was sporadically tested in children, it is more frequently assessed in youths.

Other outcome categories included education/learning (33 effects, 11.4%), physical wellbeing (25 effects, 8.6%), and socio-cultural wellbeing (25 effects, 8.6%). Interestingly, the largest proportion of large effects was found in education/learning outcomes (10 effects, 30.3% of all education/learning outcomes), indicating a strong impact of media literacy interventions in this area despite fewer tests.

No effects were reported for civic/participatory outcomes, cognitive outcomes, and technology acceptance outcomes.

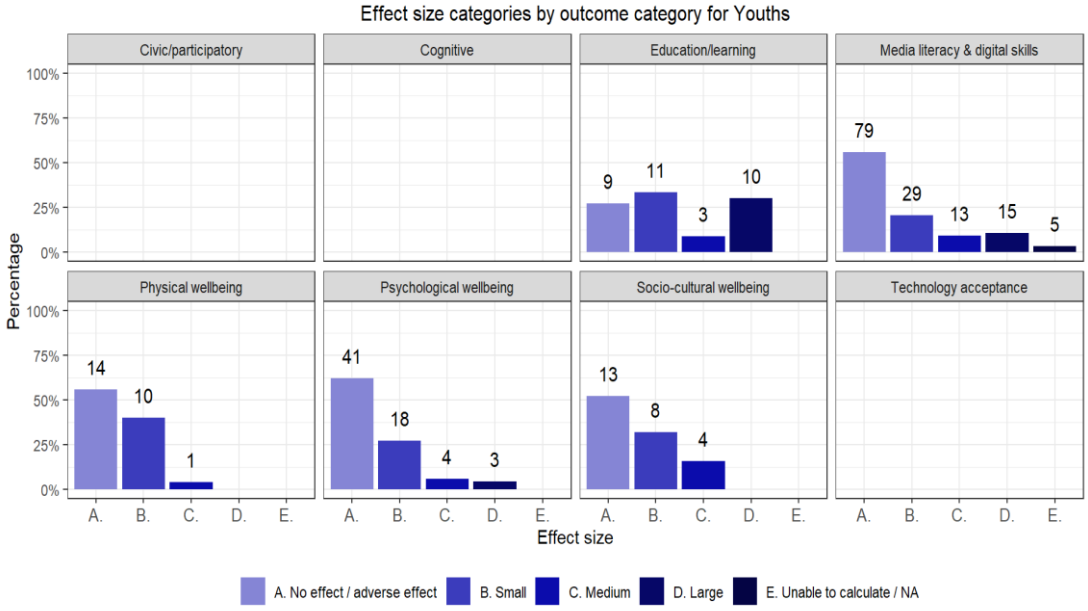

Figure 3. Effect size categories by outcome type for youths

Figure 4 presents the effects of media literacy interventions on eight outcome types for **college students**, defined as individuals attending higher education institutions, including colleges and universities. Across the 119 studies, 99 effects were tested for college students. The majority of effects were tested for media literacy and digital skills (67 effects,

67.7%). Outcomes related to education/learning (15 effects, 15.2%) and psychological wellbeing (12 effects, 12.1%) were also considered, though to a lesser extent. Effects related to cognitive outcomes (3 effects, 3.0%) and socio-cultural wellbeing (2 effects, 2.0%) were tested only sporadically. No effects were tested for civic/participatory outcomes, physical wellbeing outcomes, or technology acceptance outcomes.

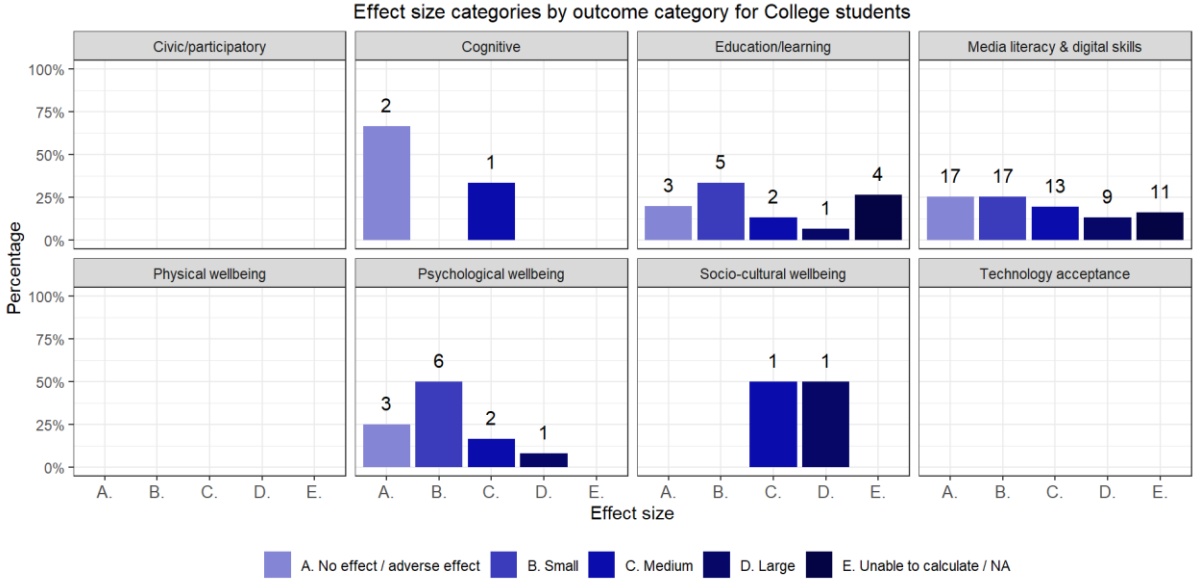

Figure 4. Effect size categories by outcome type for college students

The fourth target group identified in the analysis of 119 studies comprises **(future) teachers**. Figure 5 displays the effects of media literacy interventions on this group. Compared to children, youths, and college students, the number of effects tested for teachers is lower and limited to only half of the outcome categories. In total, 36 effects of media literacy interventions on four out of the eight outcome types were measured. The majority were concentrated within education/learning outcomes (19 effects, 52.8%) and media literacy and digital skills outcomes (14 effects, 38.9%). Only one effect was tested for civic/participatory outcomes (2.8%), and two effects for socio-cultural wellbeing outcomes (5.5%). Interestingly, the effect sizes for teachers tend to be larger: 27.8% of effects were non-significant, 8.3% were small, 8.3% were medium, and 33.3% were large. This contrasts with the proportions of large effects in other groups: 12.1% in college students, 9.6% in youths, and 29.8% in children.

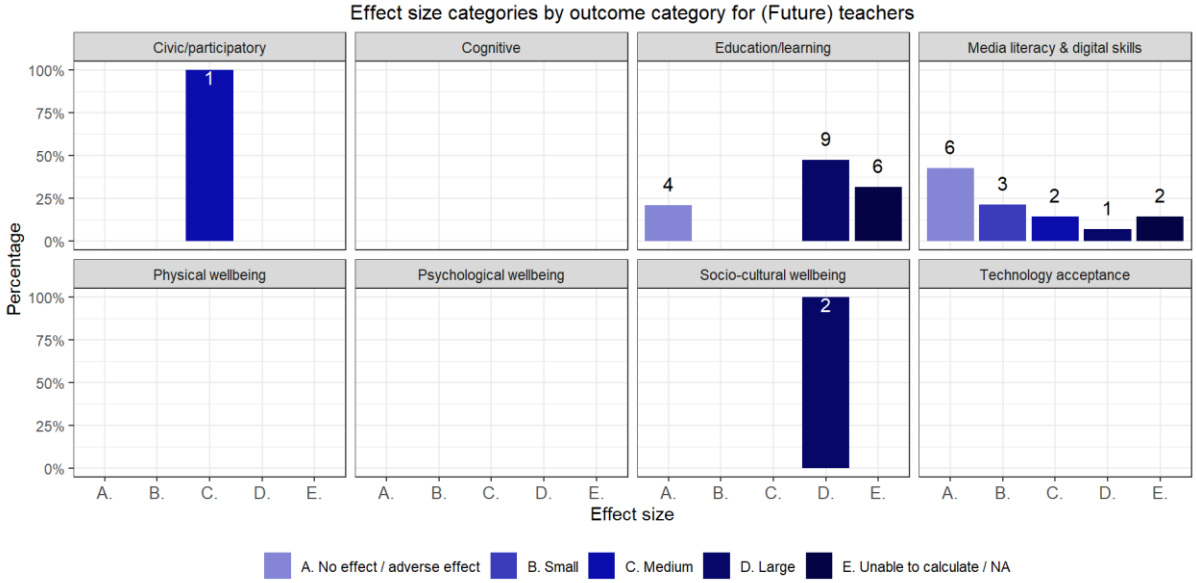

Figure 5. Effect size categories by outcome type for (future) teachers

Figure 6 presents the effects of media literacy interventions on **young adults** across eight outcome types. Only seven effects were tested for this group, possibly because many young adults are enrolled in higher education and thus included in the college student category. Additionally, college students are easier to recruit for research studies, leading to their primary inclusion in that target group rather than the broader young adult category. The seven effects were spread across three outcome categories: education/learning (one effect), media literacy and digital skills (four effects), and psychological wellbeing (two effects). Interestingly, only one of these seven effects was non-significant (14.3%).

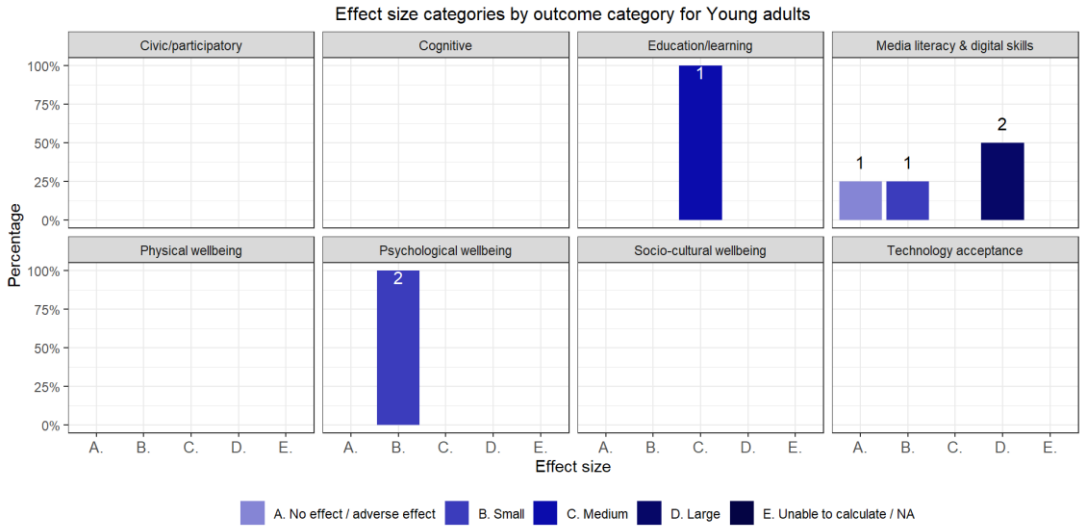

Figure 6. Effect size categories by outcome type for young adults

The next target group for media literacy interventions considered in the 119 studies is **adults**. Figure 7 displays the effects of these interventions across eight outcome types. A total of 61 effects were tested for adults, with the majority related to media literacy and digital skills (62.3%) and psychological wellbeing (31.1%). Only one effect was tested for civic/participatory outcomes (1.6%), and three for socio-cultural wellbeing outcomes (4.9%). Compared to other target groups, the proportion of larger effect sizes for adults is small, with no large effects and only one medium-sized effect (1.6%). The majority of effects were non-significant (60.7%) or small (26.2%).

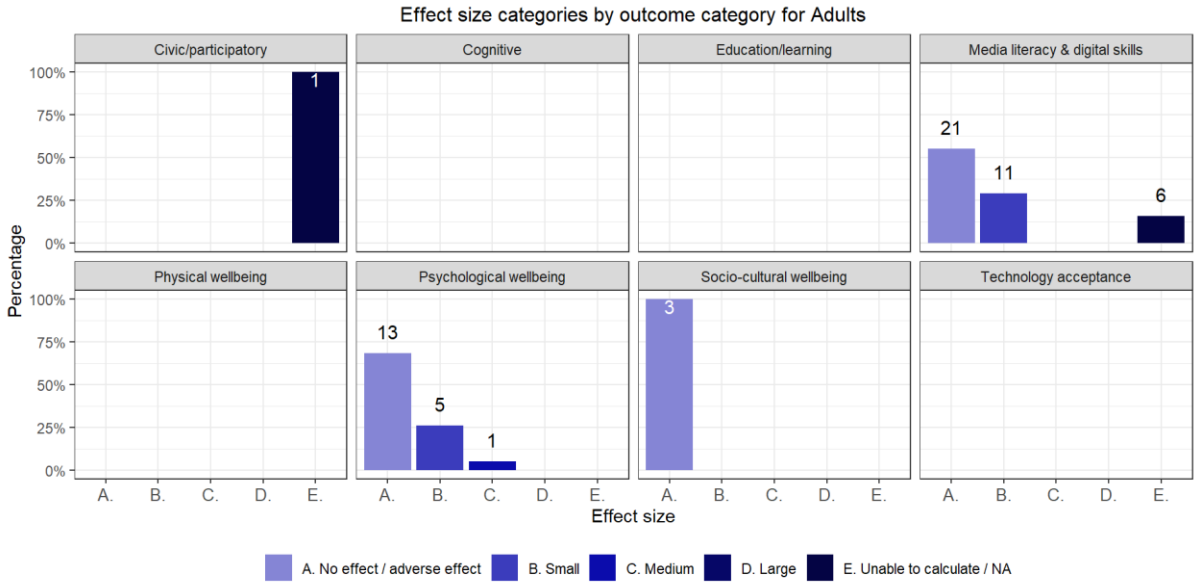

Figure 7. Effect size categories by outcome type for adults

Figure 8 presents the effects of media literacy interventions on **older adults** across eight outcome types from the 119 studies analyzed. In total, only 24 effects were tested for this target group. The majority were related to media literacy and digital skills (12 effects, 50%) and psychological wellbeing (8 effects, 33.3%). Effects on media literacy and digital skills were primarily small (4 effects, 33.3%) or medium-sized (4 effects, 33.3%), while most effects on psychological wellbeing were non-significant (5 effects, 62.5%). Only one effect was tested for physical wellbeing (4.2%) and one for socio-cultural wellbeing (4.2%). No effects were tested for civic/participatory, cognitive, education/learning, or technology acceptance outcomes in older adults.

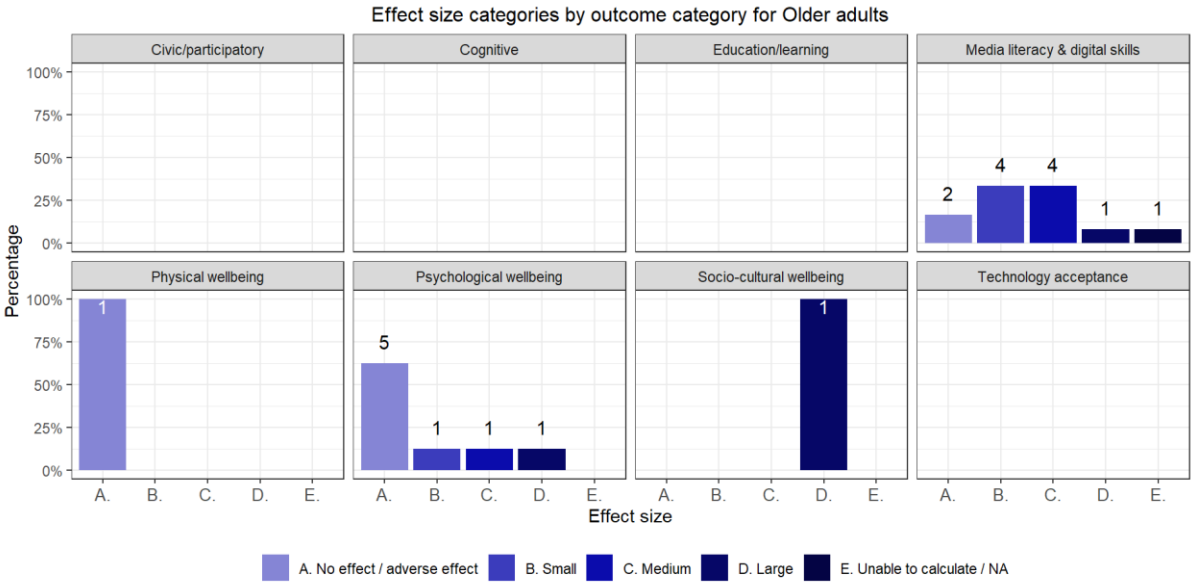

Figure 8. Effect size categories by outcome type for older adults

The next target group in the 119 studies testing media literacy interventions is **parents** (Figure 9). Parents are significantly underrepresented, with only six effects tested across two outcome types. Specifically, one effect was found for media literacy and digital skills (16.7%), and five effects for education/learning outcomes (83.3%). These effects were either non-significant (3 effects, 50%) or small (2 effects, 33.3%). One effect lacked an effect size and sufficient information for calculation. No outcomes related to civic participation, cognitive abilities, physical wellbeing, psychological wellbeing, socio-cultural wellbeing, or technology acceptance were tested for parents.

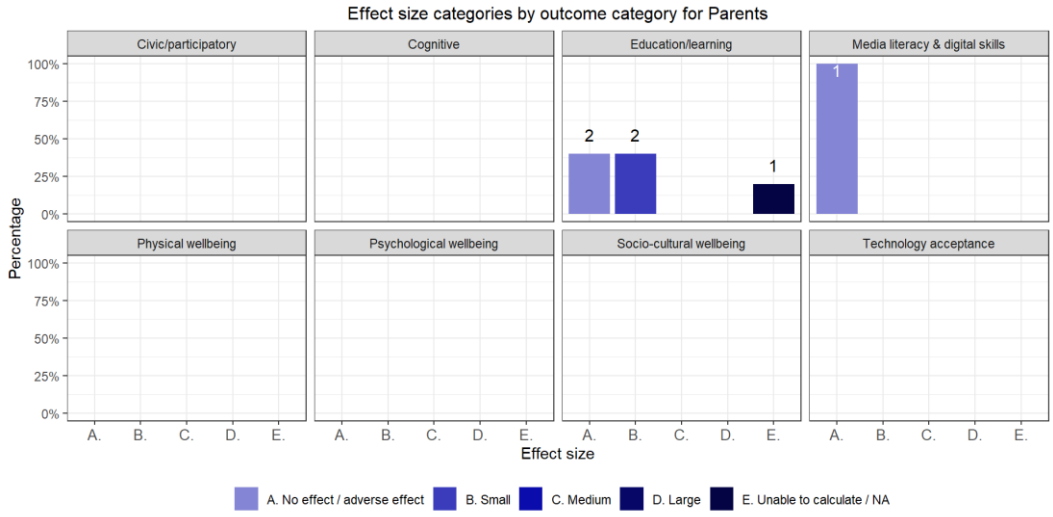

Figure 9. Effect size categories by outcome category for parents

The final target group identified in the analysis of the 119 studies is the **general public**. Figure 10 illustrates the impact of media literacy interventions on this group. A total of 18 effects were identified, all related to media literacy and digital

skills outcomes. Of these, half (nine effects, 50%) were non-significant. Additionally, four effects (22.2%) were small, four effects (22.2%) were medium, and one effect (5.6%) was large.

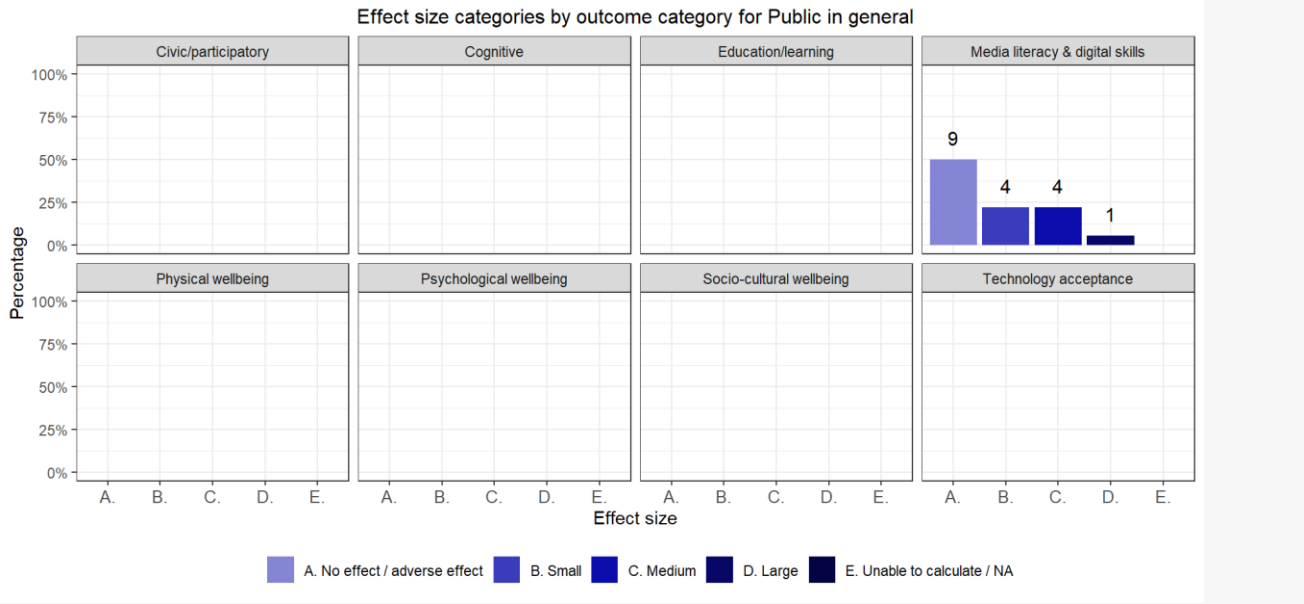

Figure 10. Effect size categories by outcome category for the public in general

4 Discussion

4.1 Discussion of findings

This systematic review aimed to synthesize evidence on effective media literacy intervention programmes. By analyzing 119 studies, we identified several critical insights and implications for future research and practice.

A solid theoretical foundation is crucial for effective media literacy interventions. Theories help guide the design, implementation, and evaluation of these interventions in three ways: they shape conceptual frameworks, provide guidance in elaborating/adopting right research tools and methods (e.g., pre- and post-tests), and enable deeper interpretation of results. While most studies in this review adopted theoretical frameworks, a minority did not, which may limit their ability to explore media literacy-related phenomena. Theories like Bandura's social learning theory (1977) and the message interpretation process (MIP) model (Austin, 2007) are frequently used to understand media literacy outcomes. Theories such as Planned Behaviour (Ajzen & Fishbein, 1975) and Technological Pedagogical and Content Knowledge (TPCK) (Mishra & Koehler, 2006) address digital competence.

Among the 119 studies, media literacy outcomes were the most examined. Following closely, outcomes concerning psychological well-being and education/learning were the second and third most extensively examined, respectively. This reflects the increasing importance of these skills in today's digital world. As individuals rely more on digital media and technology, the ability to navigate digital platforms, critically evaluate online content, and use digital tools effectively has become essential (Kirschner & De Bruyckere, 2017). Buckingham (2013) also stresses the need for media education to develop critical thinking and participatory skills in digital environments.

Researchers targeting specific digital skills naturally aim to test whether these skills improve due to the intervention, aligning with Jeong et al.'s (2012) argument about the focus on media-relevant outcomes. However, our findings challenge the assumption that media literacy interventions universally lead to positive outcomes. Despite expectations, a significant proportion of the outcomes showed no significant effect, suggesting that the effectiveness of these interventions may depend on various factors. This contrasts with Jeong et al.'s (2012) meta-analysis, which suggested that media literacy interventions generally produce favourable outcomes. Similarly, while the systematic review by Vahedi et al. (2018) found that interventions significantly improved media literacy skills and had smaller, yet positive effects on attitudes and behavioural intentions, our findings suggest a more nuanced reality. The discrepancies between

these studies and ours highlight the importance of understanding the specific conditions under which media literacy interventions succeed. As Potter (2010) emphasizes, contextual factors and methodological rigour are crucial in evaluating the effectiveness of such interventions. In line with this, the meta-analysis by Xie et al. (2019) illustrated that media literacy interventions moderately reduce adolescent deviant behaviours and maintain effects over time, reinforcing the potential of these programmes. However, our study underscores that universal positive outcomes should not be assumed without a deeper investigation into the underlying mechanisms that drive success. These findings collectively suggest that while media literacy education holds promise, a more detailed examination of the strategies and contexts that enhance intervention effectiveness is necessary.

The emphasis on psychological well-being and education/learning outcomes highlights the link between media use, mental health, and educational achievements. Rising concerns about digital media's impact on mental health, such as increased stress, anxiety, or depression, have prompted researchers to investigate these areas more thoroughly. Primack and colleagues found a significant association between media use and depression in young adults, emphasizing the importance of understanding these psychological impacts (Primack et al., 2009). However, based on our results, for the majority of these outcomes, no significant effects were reported. Another systematic review and meta-analysis of interventions with digital tools for mental health promotion among 11–18-year-olds also showed that small, but promising, effects of digital tools were found with respect to promoting well-being, relieving anxiety, and enhancing protective factors (Wright et al., 2023). There is a rising awareness of mental health issues globally, prompting more research into factors that influence psychological wellbeing. Studies have shown that media consumption and digital interactions significantly impact mental health (Zsila & Reyes, 2023), necessitating interventions that enhance media literacy and digital skills to mitigate negative effects.

Additionally, the integration of digital technologies into education has driven a focus on how these interventions influence educational outcomes and learning processes. Based on our results, only about 38% of the evaluated outcomes were effective and the remaining 62% of outcomes had no effect, small effect or we were not able to calculate the outcome effectiveness. This is sometimes in contrast with previous research such as a study by Tran-Duong (2023) who explored the impact of media literacy on effective learning outcomes in online learning. The author suggested that the four-factor construct of media literacy (functional consumption, critical consumption, critical prosumption, and functional prosumption) significantly influenced perceived learning outcomes among undergraduate students.

Furthermore, the review identified a considerable lack of studies examining outcomes such as civic/participatory engagement, physical well-being, and socio-cultural well-being. This gap highlights the need for broader outcome measures in future research to fully understand the multifaceted impact of media literacy interventions. Future studies should diversify their investigations to capture a wider range of impacts.

The analysis also revealed variations in outcomes across different target groups, ranging from children to older adults, including college students, teachers, and parents. Although previous evidence demonstrate that media literacy interventions were effective across a spectrum of age groups (Jeong et al., 2012), the results of the present study showed that the types of outcomes that are most represented in research differ with varying effectiveness depending on the target group under study, although outcomes relating to media literacy continue to dominate. For instance, for children, youths, and college students, more studies reported on outcomes relating to education and learning than for older age groups. As for their effectiveness, about 48% effects of the interventions emerged as medium and large for children. This figure was less for youth and college students indicating that more studies reported positive outcomes relating to education and learning for children compared to older age groups. These findings suggest that media literacy interventions may be more impactful for younger age groups, particularly children, in terms of educational and learning outcomes. This pattern could be due to several factors, including cognitive development stages (Buckingham, 2013), the design and delivery of interventions (Potter, 2004), and the media consumption habits of different age groups (Palfrey & Gasser, 2008).

While this pattern of larger effect sizes for specific target groups was not consistent across all outcomes and groups, it suggests that careful consideration and specification of target groups in designing and testing interventions can enhance the likelihood of achieving stronger positive effects. Future research should specifically consider the target groups or beneficiaries of media literacy interventions when evaluating their outcomes.

4.2 Study limitations

This study presents several limitations that must be acknowledged. Firstly, the search was confined to English-language publications, potentially omitting relevant studies conducted in other languages. Future research should endeavor to broaden its scope by conducting searches across multiple languages to ensure a comprehensive review of media literacy intervention literature. Secondly, the review primarily focused on quantitative research, neglecting qualitative methodologies such as interviews or observations. While quantitative studies offer valuable insights, qualitative approaches can provide nuanced perspectives on participants' experiences. Incorporating qualitative methodologies in future studies will enrich our understanding of the impact of media literacy interventions.

Thirdly, despite efforts to be exhaustive, it is possible that some relevant studies were missed in the review process. This could be due to limitations in database coverage or accessibility issues. To mitigate this, future research should employ diverse search strategies and consider alternative sources to capture a broader range of studies. Lastly, the eligibility screening and coding process involved multiple researchers, potentially introducing subjectivity. Despite attempts to ensure consistency, individual judgments may have influenced study selection and interpretation. Enhancing methodological rigour through standardized procedures and transparent reporting is imperative for future research endeavors.

4.3 Future research

Future research should explore emerging areas in media literacy interventions, including long-term effects, potential mediators and moderators of outcomes, and innovative intervention delivery methods. By addressing these limitations and advancing research in these areas, we can further our understanding of effective strategies for enhancing media literacy and digital skills across diverse populations

5 Conclusions and Recommendations

Overall, the study highlights the need for a multifaceted approach to media literacy interventions, informed by diverse theoretical frameworks and tailored to diverse target groups. To advance the field, future research should prioritize methodological rigor, incorporate a broader range of outcome measures, and explore mediators and moderators influencing intervention effects. To optimize the efficacy of media literacy interventions, the following recommendations are proposed:

1. Intervention providers should draw upon **diverse theoretical frameworks** from fields such as media studies, media psychology, and pedagogical science to inform the design and implementation of media literacy interventions. By incorporating multiple perspectives, interventions can better address the multifaceted nature of media literacy and digital skills. Theoretical frameworks enhance the depth and rigour of interventions, contributing to more effective learning and skill development across diverse populations.

2. Interventions should be **tailored to specific target groups**, considering factors such as age, gender, and socio-economic background. By addressing the unique needs and preferences of different demographics, interventions can maximize their effectiveness and relevance. Based on the reviewed studies, we identified several factors that differentiated successful interventions, such as the use of culturally relevant content for minority groups, interactive methods for younger audiences, and a focus on practical digital skills for older adults, providing concrete strategies for researchers and practitioners.

3. Researchers should **prioritize methodological rigour** in study design and implementation, including the use of randomized controlled trials (RCTs) and consistent reporting of effect sizes. Robust experimental designs are essential for drawing reliable conclusions about intervention effectiveness.

4. Future research should incorporate a **broader range of outcome measures** beyond media and digital literacy, including civic engagement, physical well-being, and socio-cultural well-being, to capture the holistic impact of media literacy interventions. The inclusion criteria for this review were designed to focus on media literacy interventions, but with a wide scope, encompassing positive outcomes across various life domains. This approach reflects the understanding that media literacy interventions often have far-reaching effects beyond just media and digital skills, influencing multiple aspects of individual and societal well-being.

5. Researchers should **explore mediators and moderators** influencing intervention effects, such as gender, socio-economic status, and prior media exposure. Understanding these factors can help identify key mechanisms driving intervention effectiveness and inform targeted intervention strategies.

6. Collaboration across disciplines, including education, psychology, sociology, and communication, can enrich intervention research on media literacy and promote innovative approaches. Interdisciplinary collaboration can facilitate a holistic understanding of media literacy and digital skills and foster the development of comprehensive intervention strategies.

By implementing these recommendations, intervention providers can develop more effective programmes that address the complex challenges of navigating today's digital landscape and promote media literacy and digital skills among diverse populations.

Acknowledgments

The authors are most grateful for the generous collaboration of their colleagues in REMEDIS, and for the reviewers' critical suggestions that helped to improve this publication.

Funding

This publication, as part of the REMEDIS project, is supported by Research Foundation – Flanders (FWO), Belgium; UK Research and Innovation (UKRI), United Kingdom; Estonian Research Council (ETAg), Estonia; Agencia Estatal de Investigación (AEI), Spain; Academy of Finland (AKA), Finland; and Narodowe Centrum Nauki (NCN), Poland under CHANSE ERA-NET Co-fund programme, which has received funding from the European Union's Horizon 2020 Research and Innovation Programme, under Grant Agreement no 101004509.

Conflict of Interests

The author declares no conflict of interests.

Data Availability

Not applicable.

Supplementary Material

Supplementary material for this article is available online in the format provided by the author (unedited). The upplementary file comprises Appendix 1 (PRISMA flow diagram), Appendix 2 (search terms), Appendix 3 (summary of the reviewed studies) and Appendix 4 (effect sizes thresholds).

References

Ajzen, I., & Fishbein, M. (1975). A Bayesian analysis of attribution processes. *Psychological Bulletin*, 82 (2), 261.

Alon, A.T., Rahimi, I.D. & Tahar, H. (2024). Fighting fake news on social media: a comparative evaluation of digital literacy interventions. *Current Psychology*, 43, 17343–17361. https://doi.org/10.1007/s12144-024-05668-4

Austin, E. W., & Johnson, K. K. (1997). Immediate and delayed effects of media literacy training on third grader's decision making for alcohol. *Health Communication*, *9*(4), 323-349.

Austin, E. W., Pinkleton, B. E., & Funabiki, R. P. (2007). *The desirability paradox in the effects of media literacy training* [doi:10.1177/0093650207305233]. Sage Publications.

Austin, E. W., Pinkleton, B. E., Hust, S. J., & Cohen, M. (2005). Evaluation of an American Legacy Foundation/Washington State Department Of Health Media Literacy Pilot Study. *Health Communication*, *18*(1), 75-95. https://doi.org/10.1207/s15327027hc1801_4

Ayala, G. X., & Elder, J. P. (2011). Qualitative methods to ensure acceptability of behavioral and social interventions to the target population. *Journal of Public Health Dentistry*, *71*(s1), S69-S79. https://doi.org/https://doi.org/10.1111/j.1752-7325.2011.00241.x

Bandura, A. (1977). Social learning theory. Oxford, England: Prentice-Hall.

Buckingham, D. (2013). *Media Education: Literacy, Learning and Contemporary Culture*. Polity.

Buijzen, M. (2007). Reducing children's susceptibility to commercials: Mechanisms of factual and evaluative advertising interventions. *Media Psychology*, *9*(2), 411-430.

Byrne, S. (2009). Media Literacy Interventions: What makes them Boom or Boomerang? *Communication Education*, *58*(1), 1-14. https://doi.org/10.1080/03634520802226444

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed. ed.). Lawrence Erlbaum Associates.

Edwards, L., Stoilova, M., Anstead, N., Fry, A., El-Halaby, G., & Smith M. (2021). *Rapid evidence assessment on online misinformation and media literacy: final report for Ofcom*. Ofcom. Retrieved June 27 from www.ofcom.org.uk

Fishbein, M., & Yzer, M. C. (2003). Using Theory to Design Effective Health Behavior Interventions. *Communication Theory*, *13*(2), 164-183. https://doi.org/https://doi.org/10.1111/j.1468-2885.2003.tb00287.x

Haddon, L., Cino, D., Doyle, M.-A., Livingstone, S., Mascheroni, G., & Stoilova, M. (2020). *Children's and young people's digital skills: a systematic evidence review*. KU Leuven: ySKILLS. https://doi.org/10.5281/zenodo.4160176

Helsper, E. J., Schneider, L. S., van Deursen, A. J. A. M., & van Laar, E. (2020). *The youth Digital Skills Indicator: Report on the conceptualisation and development of the ySKILLS digital skills measure*. KU Leuven: ySKILLS.

Hobbs, R. (1999). The seven great debates in the media literacy movement.

Hobbs, R., & Frost, R. (2003). Measuring the acquisition of media-literacy skills. *Reading research quarterly*, *38*(3), 330-355.

JASP Team. (2024). *JASP*. In (Version 0.17.1) [Computer software].

Jeong, S. H., Cho, H., & Hwang, Y. (2012). Media Literacy Interventions: A Meta-Analytic Review. *Journal of Communication*, *62*(3), 454-472. https://doi.org/10.1111/j.1460-2466.2012.01643.x

Kirschner, P. A., & De Bruyckere, P. (2017). The myths of the digital native and the multitasker. *Teaching and Teacher Education*, *67*, 135-142.

Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, *33*(1), 159-174.

Livingstone, S., Mascheroni, G., & Stoilova, M. (2021). The outcomes of gaining digital skills for young people's lives and wellbeing: A systematic evidence review. *New Media & Society*, *25*(5), 1176-1202. https://doi.org/10.1177/14614448211043189

Marten, H. (2010). Evaluating media literacy education: Concepts, theories and future direction. *Journal of Media Literacy Education*, *2*(1), 1-22.

McCannon, R. (2009). Media literacy/media education: Solution to big media? In V. Strasburger, B. Wilson, & A. Jordan (Eds.), *Children, adolescents, and the media* (pp. 519–569). Sage.

Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record*, 108(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *BMJ*, *6*(7), e1000097. https://doi.org/10.1371/journal.pmed.1000097

Olejnik, S., & Algina, J. (2003). Generalized eta and omega squared statistics: Measures of effect size for some common research designs. *Psychological Methods*, *8*, 434–447.

Palfrey, J., & Gasser, U. (2008). *Born digital: Understanding the first generation of digital natives*. Basic Books.

Passey, D. (2020). Theories, theoretical and conceptual frameworks, models and constructs: Limiting research outcomes through misconceptions and misunderstandings. *Studies in Technology Enhanced Learning*, 1(1). https://doi.org/10.21428/8c225f6e.56810a1a

Potter, W. J. (2004). *Theory of Media Literacy : a Cognitive Approach*. SAGE publication. https://doi.org/10.4135/9781483328881

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

Primack, B. A., Swanier, B., Georgiopoulos, A. M., Land, S. R., & Fine, M. J. (2009). Association between media use in adolescence and depression in young adulthood: a longitudinal study. *Archives of General Psychiatry*, *66*(2), 181-188. https://doi.org/10.1001/archgenpsychiatry.2008.532

Qualtrics. (2022). *Qualtrics* In [Software]. https://www.qualtrics.com

Scull, T. M., Kupersmidt, J. B., & Weatherholt, T. N. (2017). The effectiveness of online, family-based media literacy education for substance abuse prevention in elementary school children: Study of the Media Detective Family program. *Journal of Community Psychology*, *45*(6), 796-809. https://doi.org/10.1002/jcop.21893

Scull, T. M., Malik, C. V., Keefe, E. M., & Schoemann, A. (2019). Evaluating the Short-term Impact of Media Aware Parent, a Web-based Program for Parents with the Goal of Adolescent Sexual Health Promotion. *J Youth Adolesc*, *48*(9), 1686-1706. https://doi.org/10.1007/s10964-019-01077-0

Tran-Duong, Q. H. (2023). The effect of media literacy on effective learning outcomes in online learning. *Education and Information Technologies*, *28*(3), 3605-3624. https://doi.org/10.1007/s10639-022-11313-z

Vahedi, Z., Sibalis, A., & Sutherland, J. E. (2018). Are media literacy interventions effective at changing attitudes and intentions towards risky health behaviors in adolescents? A meta-analytic review. *Journal of Adolescence*, 67, 140-152. https://doi.org/10.1016/j.adolescence.2018.06.007

Vissenberg, J., Puusepp, M., Edisherashvili, N., Tomczyk, L., Opozda-Suder, S., Sepielak, D., Hietajärvi, L., Maksniemi, E., Pedaste, M., & d'Haenens, L. (2023). Report on the Results of a Systematic Review of the Individual and Social Differentiating Factors and Outcomes of Media Literacy and Digital Skills. KU Leuven: REMEDIS. https://doi.org/10.5281/zenodo.10356744

Wright, M., Reitegger, F., Cela, H., Papst, A., & Gasteiger-Klicpera, B. (2023). Interventions with Digital Tools for Mental Health Promotion among 11–18 Year Olds: A Systematic Review and Meta-Analysis. *Journal of Youth and Adolescence*, *52*(4), 754-779. https://doi.org/10.1007/s10964-023-01735-4

Xie, X., Gai, X., & Zhou, Y. (2019). A meta-analysis of media literacy interventions for deviant behaviors. *Computers & Education*, 139, 146-156. https://doi.org/10.1016/j.compedu.2019.05.008

Zsila, Á., & Reyes, M. E. S. (2023). Pros & cons: impacts of social media on mental health. *BMC Psychology*, *11*(1), 201. https://doi.org/10.1186/s40359-023-01243-x

About the Authors

Photo and Biography