Can I trust this information? Using adolescent narratives to uncover online information seeking processes

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ABSTRACT

Adolescent internet usage is incredibly prevalent, marking a need for educational support as they navigate online texts. As online texts are prone to bias and misinformation, it is important to fully understand how young people conceptualize this information and where they need support. These texts may also contain harmful messages, particularly for typically marginalized groups. Higher levels of literacies related to online media consumption have been shown to mitigate these negative effects, and may help to limit bias and increase criticality. Researchers have illuminated underlying processes surrounding online text comprehension, though research is limited on these processes in authentic spaces. Utilizing think-aloud, focus group, and observational data, the present study seeks to understand adolescent online research and information-seeking skills, providing implications for literacy educators and curriculum developers.

Keywords: *information literacy, think-alouds, media literacy, literacy curriculum*.

INTRODUCTION

In 2022, 95% of American teenagers, aged 13-17 reported smartphone usage and 97% reported daily internet use (Vogels, Gelles-Watnick & Massarat, 2022). Similarly, 95% of teens reported using Youtube and social media platforms, including Snapchat and TikTok. As internet use climbs, increased exposure to online texts and media can bombard adolescents with information they may not be fully equipped to understand. The skills needed to be literate in contemporary society expand beyond those needed for traditional literacy (i.e. reading and writing) and include a variety of updated skills, including navigating information, evaluating it for utility and credibility, and comparing multiple information sources (Turner, Hicks & Zucker, 2020; Hobbs & Jensen, 2009).

Adolescent learners benefit from increased experiences that create background knowledge to further aid with reading comprehension and strengthening literacy skills (Alvermann & Sanders, 2019). These experiences often involve digital environments, including social media platforms, which facilitate a variety of literacy practices including consuming and producing digital texts (Hobbs & Jensen, 2009). Background knowledge gained through these experiences and through academic settings help adolescent learners to facilitate knowledge construction as they integrate new information within their existing knowledge across a range of contexts (Fisher & Frey, 2013).

Though adolescents are often assumed to be digitally and media literate, many need explicit instruction to bridge the gap between their out of school literacies and their academic literacies, particularly those pertaining to online research and information processing, as many adolescents have been shown to lack more critical understanding of how to interpret information found online (Scolari, 2019). Specifically, adolescents are not always very skilled with online research, comprehension, and critical evaluation. In fact, a 2018 International Computer and Information Literacy Study (ICILS) found that in the United States, only 2% of 8th grade participants performed at the highest level of computer and information literacy. The measure explores an individual's capability "to use information communications technologies (ICT) productively for a range of different purposes, in ways that go beyond a basic use of ICT" (Fraillon et al., 2019). More specifically, through a digital real-world scenario, the measure assessed the digital and critical skills needed to process information found online.

With the integration of digital technologies and the prolific availability of information to the public, skills designed to support accessing this information, understanding how the information was created, and evaluating the information for utility and credibility, become paramount for literacy above simply being able to read, write, and speak – particularly as these skills may be interrelated. In fact, it has been argued that inefficiency in these more contemporary literacy skills create a culture of ignorance and undermine traditional literacy through limited understanding of information, information sources, and credibility in reading, writing, and other forms of communication (Bhatt & MacKenzie, 2019). Thus, it becomes especially important to support contemporary literacy skills amongst adolescent populations. Research investigating youth information-seeking processes in authentic spaces is limited, particularly as this relates to critical consumption of information. Further, as schools are centers of literacy development, understanding adolescents' skills in a more expanded definition of literacy is important to help shape curriculum and address the needs of students as they move toward more independent work both in and out of academic settings. As such, the present study, drawn from focus group, observational, and think-aloud data, was designed to understand online research processes through authentic adolescent experience to inform educators in supporting adolescents as they increasingly consume texts online. The study addressed the following research questions:

1. How do adolescents conceptualize literacy in online spaces, including social media, specifically in terms of consuming information online?
2. How do adolescents seek information online when unguided, specifically how do adolescents evaluate online sources for credibility, bias, perspective, and utility?
3. What is the role of the school in supporting online research practices and literacies?

CONCEPTUAL FRAMEWORK

Research, particularly the New Literacies framework, addressed the need for updating our understanding of literacy to include new digital practices to increase reading comprehension and communication across multimodal texts (Leu et al., 2018). As technology continues to progress, this framework further outlines the need for continuous reassessment of

the literacies needed in contemporary society. Literacies are often socially constructed and social media platforms contribute heavily to how adolescents develop their identities as literate individuals and construct meaning of the world around them (Alvermann, 2022). As the world rapidly changes, different terminology for multiple forms of literacy have emerged, including *digital literacy*, or the abilities needed to navigate digital platforms and online environments (Martínez-Bravo, Sádaba-Chalezquer & Serrano-Puche, 2020). *Media literacy* is defined as the set of skills needed to fully access, comprehend, critically evaluate, and create messages through multiple forms of media, and includes information literacy, or the ability to discern fact from fiction (Metzger et al., 2015; Hobbs & Jensen 2009). Hobbs (2019) envisioned media literacy as grounded in five central principles: 1) all media messages are constructed 2) media messages use medium- and genre-specific codes and conventions 3) different people interpret media messages differently 4) media have embedded values and points of view, and 5) media messages have political, economic, and social power because they influence perceptions, attitudes, and behavior. A clear definition of media literacy also includes an understanding of media creation. When young people are faced with information online, they need to understand how online texts are created and by whom to fully evaluate the usefulness, truthfulness, and applicability of the information. Knauss (2022) further argued that *making*, including applying, doing, tinkering, and creating, is an essential part of effective media and new literacy education along these principles. Making and creation can and should include crafting social media posts and sharing information for various audiences, particularly as we seek to understand how individuals are conceptualizing information found through social media. As schools seek to support adolescent literacy, these literacy practices should be a part of the curriculum to help learners meet contemporary literacy demands.

The need for a deeper understanding of current online research processes is increasingly important with regards to helping adolescents evaluate information found online that may shape their views over time and in aiding practitioners in supporting these processes. With the prolific spread of misinformation through internet and social media platforms, teens, media literacy, with an emphasis on evaluating sources and bolstering information literacy, is vital, particularly for ensuring civic, personal, and career success in adulthood (Bulger & Davidson, 2018). If the goal of education is

to firmly prepare students for effective participation in society and success in job and career goals outside of K-12 education, literacy instruction needs to encompass digital literacy, media literacy, and critical literacy. These literacies support traditional literacy needed for communication and bolster problem-solving skills that are essential in academic, workplace, and personal domains (Martínez-Bravo et al., 2020). Further, reinforcing traditional literacy practices online in conjunction with New Literacies can be especially beneficial for teens who may be struggling with traditional reading and writing skills (Leu et al., 2018).

Multiple definitions for these literacies often confuse the understanding of literacy skills, though these individual literacies are essential to help individuals become fully literate to access and comprehend a variety of texts across contexts critically, particularly within educational contexts. Thus, the New Literacies framework incorporated these skills under the umbrella of literacy, acknowledging the importance of teaching and learning digital and media literacy skills as technology is an inescapable aspect of modern society, altering how we teach and enact literacy. Though arguments exist as to the importance of maintaining traditional reading skills and the superiority of reading offline, it remains that most adolescents are constantly consuming texts online, requiring a restructuring of our understanding of being literate and the ways in which we teach literacy in schools, particularly in the secondary grades (Firth et al., 2019). As such, the present study adopts the New Literacies frame to guide our understanding of teaching literacy and supporting adolescent literacy needs, particularly in strengthening and understanding online research and information skills.

Literature review

Research on adolescent literacy practices outside of traditional literacy achievement is relatively limited, with most studies on contemporary literacies focused on well-being outcomes and corresponding interventions (Wusylko et al., 2022). Research investigating news and health literacy interventions for teens, as well as theoretical explorations of social media literacy needs is growing (Shreurs & Vandenbosch, 2021; Geers, Boukes & Moeller, 2020). However, with the prolific rise in adolescent digital media use for academic and personal reasons, it is urgently important to understand what literacy practices adolescent learners need in these settings to fully understand the best ways in which

schools can support their literacy development (Vogels et al., 2022). Exploration of these literacy practices is also limited in the extant research as adolescent voices and experiences have often been excluded in favor of testing media literacy interventions and evaluating academic performance. When authentic adolescent voices are included in the methodology, results can be incredibly powerful. For example, De Leyn et al. (2021) worked with adolescents to understand how they conceptualized media literacy in school settings. Results indicated that many teens viewed online settings as risky, especially when discussed by adults, and often expressed heavy skepticism towards online information and interactions. Participants also reported feeling stereotyped outside of school due to heavy media use but felt more supported by educators and schools to explore their media literacy. These results highlight a need to empower young people as they navigate these spaces and portray schools as the best place to start media literacy initiatives.

When faced with information via digital spaces, including social media platforms, learners require further evaluation as digital content contains an aspect of bias based on the poster, the platform, and the audience, and technological nuances that can contribute to altering meaning (Alvermann, 2017). Use of social media is a clear example of students out-of-school literacies that need to be reconciled in the classroom, particularly as information is readily exchanged and consumed through these platforms. Turner et al., (2020) argued further that due to the widespread availability of digital and social media texts, educators must bring these texts into the classroom to ensure a thorough evaluation of texts based on facts and credibility assessment rather than emotional engagement. Research in the field of social media literacy is limited, particularly for adolescent populations, but is growing theoretically (Cho et al., 2022; Schreuers & Vandenbosch, 2021). Cho and colleagues (2022) conceptualized social media literacy, or SoMeLit, as individually constructed and often not subject to academic standards, rendering instruction surrounding social media literacy and other new literacies incredibly important to supporting comprehension of these texts through credibility evaluation and understanding of creation.

There has been some research done concerning the perspective of adolescents on their own digital capabilities that reveal some of the nuances of how literacy practices occur online. For example, Washburn and Myers (2023) found adolescent participants

reported being confident in their abilities to identify sound information online. These adolescents also reported their appreciation for digital capabilities, particularly being able to search and read online texts and conduct online research and cited this as their primary method for learning. This study highlights some of the work being done to integrate learners' voices in their literacy processes, including their preferences and confidence in their skills. Loh, Sun, and Lim (2023) explored literacy practices outside of school for adolescent girls and found their digital acumen in navigating multiple platforms and devices to be high and highlighted their strong ability to adapt in digital settings in a variety of contexts. The participants also reported reading often on digital devices, accessing texts they found through others sharing texts, finding texts through social media, and actively searching for information on their own, underscoring the importance of understanding how adolescents are searching for and evaluating information in digital settings.

Adolescent information literacy

How adolescents seek information online may look different across individuals, particularly as devices, purposes, and abilities vary, though researchers have identified skills that underlie the online research process: identifying a problem, locating information, evaluating source material, synthesizing multiple sources of information and communicating information (Leu et al., 2018). They also emphasized the importance of additional skills beyond traditional literacy skills required when reading and seeking information online, including flexibility and reliance on information literacy, or the ability to decipher fact from fiction (Hobbs & Jensen, 2009). These component skills overlap with traditional reading skills, including negotiating multiple sources through evaluation and critical thinking, identifying sources for utility, and finding the main ideas of texts (Cho & Afflerbach, 2015; Cho, 2013).

Leu and colleagues (2018) suggested that the first step in online research, is identifying a problem, in which an individual must design a search query and understand their purpose in searching for information. Identifying the problem and/or topic to be searched triggers a plethora of online reading skills paramount to conducting effective online research. Taken together, effective online researchers are skilled at identifying their purpose in reading, locating and searching for information related to this purpose, evaluating

information found, synthesizing information from multiple sources, and communicating this information. Finding information both on- and off-line requires specific skills to help students navigate large volumes of text to pull relevant information. These skills differ in online spaces, as the information available is nearly limitless and can be published by a variety of sources, required additional skills for efficient comprehension.

Evaluating source material and information literacy. A key part of New Literacies, specifically concerning online research skills, is information literacy, or the ability to decipher fact from fiction (Hobbs & Jensen, 2009). Effective source evaluation, supported by information literacy skills, has been studied with regards to numerous populations, to similar findings – many people rely on surface level strategies, including making judgements as to the website domain and visual components, and prior knowledge of source material, including placing trust in news sources they have seen before (Metzger, Flanagin & Medders, 2010; Metzer & Flanagin, 2015). Overall, research has shown that adolescents, particularly early adolescents, struggle with source credibility evaluation in online spaces. For example, using data gleaned from Online Research Comprehension Assessment (ORCA), a multifaceted assessment of online research that incorporates Internet simulation experiences, including a social network, for a performance-based assessment, Forzani, Corrigan, and Kiili (2022) uncovered struggles in the information seeking process specifically pertaining to evaluation of sources. These findings support earlier studies, including Coiro, Coscarelli, Maykel, and Forzani (2015), who found seventh grade students able to navigate credibility by relying on strategies, but struggled immensely when asked to justify their credibility analysis of their sources. This points to further reliance on heuristics without a deeper understanding of credibility evaluation and source judgements.

Those adolescents with a nuanced understanding of media literacy and production have been shown to make higher level credibility evaluation and criticality regarding news content (Ku et al., 2019). However, adolescents have also been shown to struggle with identifying fake news and hoaxes even after extensive credibility training, leading researchers to believe they may apply strategies superficially without a deeper understanding as to their utility (Metzger et al., 2015; Leu et al., 2008). These results hold amongst even the students who demonstrated the highest traditional literacy achievement scores, indicating these skills as an extension of traditional literacy requiring specific support. Though conducted with undergraduates, Tilleul (2023) found despite the increased experience navigating digital information, including information found through social media, young adults did not show an increase in media literacy skills. These results highlight a need for understanding how young people seek and evaluate information online to identify the best ways in which schools can support these skills.

Synthesizing multiple sources of information. In addition to evaluating source material and making credibility judgements, online research entails synthesizing information from various sources (Coiro, Sparks & Kulikowich, 2018). These sources often contain conflicting information and reflect inherent biases of authors and publishers. These issues are further compounded when using texts found through social media. The skills related to utilizing information found through multiple sources is not unique to online research and is an essential part of the traditional research process. However, online spaces make this information more readily accessible and with less vetting through the publication process as any individual or organization can post information and opinion readily online.

Identifying key processes for accessing multiple sources, Wineburg and McGrew (2019) identified vertical and lateral online reading strategies that highlight how one conducts research online. Vertical reading entails staying on one website for evaluation, potentially searching for dates of publication, author information, and other identifying characteristics on the page. Lateral reading occurs when an individual scans multiple websites to check the reliability of one website. This can include searching online for information about an author, organization, or other facts presented in a website by opening other tabs. In this study, educated and older users, including those with PhDs, were sometimes limited to vertical reading, which was found to be less effective for fully evaluating an online source. Using this framework with adolescents, researchers found that most adolescents relied more heavily on vertical reading strategies when searching for information online, though were responsive to explicit instruction in lateral reading (Walsh-Moorman & Pytash, 2022). Similarly, when investigating adolescents' consumption of news and information literacy through social media, Yu, Kong, Song, Dang, Kang, and Hu (2019) found they are often adept at comprehending the information presented but struggled with evaluating claims made across various sources potentially highlighting a more limited understanding of

the critical component of evaluating digital media and bringing together multiple sources.

Access to an array of viewpoints on a variety of issues should be conducive to increased criticality and reflection as users take in these viewpoints and integrate them within their prior knowledge. However, many individuals, particularly adolescents, are not skilled at navigating multiple viewpoints critically. In fact, Braasch et al. (2022) found that adolescents researching controversial tasks for an essay were more likely to seek confirmation of their opinions and knowledge when locating sources and using these limited sources in their completed work. Evidence of confirmation bias is well-documented in the literature, rendering an understanding of how to counteract this phenomenon as individuals navigate multiple sources of information (Abendroth & Richter, 2020).

Media literacy interventions and curriculum

Researchers, educators, and parents have expressed concerns regarding the potential negative impacts of increased internet usage on children and teenagers, including exposure to inappropriate content, social disconnection, addiction, body image issues, and diminished self-esteem amongst others (Course-Choi & Hammond, 2021). New Literacies, specifically including digital and media literacy, are incredibly important for young people, as interventions supporting the development of media literacy skills have been shown to potentially mitigate many of these negative effects stemming from increased internet usage (Kurz, Rosendahl, Rodeck, Muehleck & Berger, 2022; Jeong, Cho & Hwang, 2012). For example, amongst adolescent girls, an educational media literacy intervention had a positive impact on body satisfaction and increased critical consumption of messages online pertaining to body image (McLean, Wertheim, Marques & Paxton, 2019). These results held in follow-up assessments. Having high media literacy skills, including information and critical literacy skills, has been shown to buffer against the negative effects of exposure to racist or harmful messages online and may even protect teens from negative body image issues stemming from media exposure (Bell et al. 2022; Gordon et al., 2021; Paxton, McLean & Rodgers, 2022; Volpe et al., 2021).

Researchers have also begun to isolate health information literacy as adolescents have reported being aware of potential information variances in trustworthiness but display varied abilities to effectively evaluate and navigate these sources (Freeman, Caldwell & Bennett, 2018). As such, many researchers have developed concerns about adolescents' ability to navigate health information online due to poor information and New Literacies skills which may lead to using surface level strategies that may be ineffective in making judgements on source quality (Colditz, Woods & Primack, 2018). Media literacy interventions have been shown to have positive effects on health behavior, including increased criticality regarding tanning behaviors, smoking, and alcohol usage, particularly when digitally researching these topics (Mingoia et al., 2019; Xie, Gai & Zhou, 2019).

Interventions surrounding overall credibility evaluations have been shown to be successful with multiple populations in K-12 settings. Using an information literacy intervention in Language Arts classes with eight graders, Kohnen, Dawson and Mertens (2022) found that early adolescents were especially susceptible to guidance regarding source evaluation and particularly if they demonstrated open-mindedness and healthy skepticism. Similarly, Henry, Castek, O'Byrne and Zawilinksi (2012) found a direct positive effect of a credibility intervention on online literacy skills and overall academic achievement. These positive findings support the need for nuanced literacy curriculum which includes instruction pertaining to new literacies to enhance traditional and contemporary literacy achievement. This is particularly true as the stakes for online information evaluation are higher as individuals evaluate political and health that may influence their civic engagement and personal behavior (Austen, Borah, & Domgaard, Guess & Munger, 2023; Zimmerman, 2021).

Outside of targeted interventions, media literacy curriculum, particularly in high school settings is relatively unexplored in the literature in terms of embedded implementation. In fact, Hobbs, Moen, Tang and Steager (2022) investigated implementation of media literacy curriculum in Rhode Island schools and found varied greatly, indicating a lack of formalized requirements, lack of support from stakeholders, and potential limits in available technology. Similarly, in a survey study of secondary educators, Harvey, McNelly and Buxton (2023) identified numerous challenges for teachers as they sought to integrate media literacy in their practice, including lack of training, time constraints, and pushback from administrators. As adolescents may not possess high level critical skills pertaining to evaluating media, particularly news media, it remains that schools should implement media literacy curriculum to support these skills and ensure that by the

time students reach high school, they understand how to navigate and evaluate online texts critically (Tamboer, Kleemans, Molenaar & Bosse, 2023).

The relationship between media literacy and traditional literacy

In terms of academic considerations for curriculum supporting information and communication technology skills (ICT), including but not limited to media literacy, positive effects on traditional literacy achievement and other academic subjects have been well-documented (Lei, Xiong, Chiu, Zhang & Cait, 2021). Research is limited as to a direct connection between media literacy instruction and academic achievement, though Leu et al. (2018) conceptualized increased skills within the New Literacies frame as beneficial for those struggling with traditional literacy, including traditional research, as online spaces offer additional supports for students and may increase engagement. Understanding what may predict efficient online research and comprehension is important in terms of identifying individuals for intervention and fine-tuning literacy curriculum. Coiro (2011) found that traditional literacy skills have a predictive effect on online reading comprehension for middle school participants. Additionally, higher online reading comprehension skills were shown to potentially aid participants with low prior knowledge on their topics as they are more adept at locating and evaluating information. This is a crucial argument for understanding and supporting online research processes in adolescent populations as these skills may help to account for differences in individual background knowledge and experience.

Understanding adolescent online research and new literacies processes in authentic spaces is important in supporting educators in developing curriculum to support these skills. Turner and Hicks (2022) outlined a specific need to mandate new literacies curriculum as standard practice in literacy instruction stemming from reports of teachers in the classroom supporting digital learning during the pandemic in traditional ways – translating traditional curriculum to be viewed online, rather than incorporating authentic new literacies practices in online learning. These skills are also relevant considering extant research demonstrating the shortcomings of many adolescents as they navigate information in digital spaces. Thus, the current study explored the roles of schools in supporting New Literacies and how adolescents view this role in relation to their authentic literacy practice in and out of school.

METHOD AND ANALYSIS

The study was conducted at a large Northeastern high school in the United States with two public-speaking classes engaged in online research to present "controversial topic" speeches during the spring semester of 2022. Between the two classes, there were 37 students aged 17-19 years old who participated in the focus groups. Public-speaking classes were chosen as part of the English Language Arts department as these courses were taught by a veteran English teacher who was interested in the research questions and had flexibility in the curriculum. Media literacy was also not specifically taught within the context of this class, potentially allowing for more authentic flow of ideas from students. All students were in 12th grade. The sample was composed of slightly more male participants (59.5%) than female participants. In terms of race, 67.6 percent of the sample was white and only 16.2% reported identifying as Hispanic or Latinx. See Table 1 for a demographic summary of the sample.

Table 1. *Sample demographics (n = 37)*

Factor	Frequency	Percent
Gender		
Female	15.0	40.5
Male	22.0	59.5
Age		
17	21.0	56.8
18	15.0	40.5
19	1.0	2.7
Race		
White/Caucasian	25.0	67.6
Black/African-American	8.0	21.6
Mixed Race	2.0	5.4
Other/Not Specified	2.0	5.4
Ethnicity		
Hispanic	6.0	16.2
Not-Hispanic	31.0	83.8

Procedure

Prior to entering the classroom, the classroom teacher administered the New Media Literacy Survey via paper handouts. The classroom teacher ensured all students took this survey by administering it during multiple sessions to catch any absent students. These were collected and scored by the research team. Two researchers checked each score for reliability. Scores were then entered into a spreadsheet and uploaded to SPSS for analysis to characterize the sample.

During data collection for the think-aloud process, we sought to capture responses from those participants who completed the New Media Literacy Survey.

The research team visited the classroom to conduct four focus groups with different groups of students in each of the two classes over a two-week period. These focus groups were recorded and transcribed using Otter.ai software. Transcripts were checked for reliability by a second research assistant. The week after the focus groups were finished, the classroom teacher assigned and discussed their final project – an oral presentation with a written component taking a clear side on a controversial issue. Once students were familiar with the project and chose topics, the research team conducted think-alouds with multiple students in which they searched for information online and spoke aloud their process for recording and transcription. These think-alouds took place over two weeks to fully capture as many students as possible in accordance with those who took the NMLS.

New media literacy survey

Prior to entering the school for data collection, the classroom teacher administered the New Media Literacy Survey (Lee, Chen, Li, & Lin, 2015) to assess comfort levels using digital media. This measure is a comprehensive self-report measure that conceptualizes media literacy along four domains of media literacy and measured associated skills: 1) functional consuming literacy refers to the ability to consume media content, including basic comprehension of information found online; 2) critical consuming literacy refers to the ability to analyze and interpret media messages beyond the surface meaning, including challenging, questioning credibility, and criticizing online sources; 3) functional prosuming literacy, or the technical skills needed to create and distribute different types of media including creating social media posts, producing videos, and other content creation; and finally 4) critical prosuming literacy, or active participation in new media environments, including social media, and understanding the social and ideological issues associated with being online. Though slightly dated, this measure was chosen as it represented a comprehensive understanding of the skills needed to evaluate digital information without limiting responses to certain constructs (e.g., digital literacy, media literacy). The self-report survey was used to gain an overall understanding of the students' media literacy comfort levels and perceived skills.

Each section is rated either by agreement using typical five-point Likert scale ranging from strongly disagree to strongly agree, independence, or frequency. For the independence sections, participants rated statements based on their ability to complete the task independently or with help. A score of 1 indicates the highest level of independence ("Without any help from other people") and a 5 indicates the ability to complete the task only with other people's help. Thus, in the independence sections, higher scores indicate lesser ability to complete a media task without help and measure specific technical skills. For the agreement sections, higher scores indicate comprehension of certain aspects of media environments. Frequency sections were rated on a five-point scale from "never" to "very often", indicating how frequently the participant engages with different media activities.

For the 'functional consuming literacy' domain, there were two subsections of the measure. The first was skill based and assessed one's independence with basic media consumption activities (e.g., "read emails with attachment files"). The second was based on comprehension and was measured by the agreement scale (e.g., "I can recall main ideas after watching a video clip"). 'Critical consuming literacy' was broken into three sections, the first two assessing frequency of using analysis and synthesis skills and the last assessing agreement with understanding how to evaluate online material. The 'functional prosuming literacy' domain was divided into three sections measuring independence with related skills (ability to "use instant message software such as MSN, Skype, Gmail Chat, or Facebook Chat to send messages"), and the frequency with which one distributes ("I use build-in function on social network websites to share my feelings such as like/dislike") and produces media ("I add comments when I use the "share" function to pass on the information"). Lastly, the 'critical prosuming literacy' domain contained one section measuring the frequency with which a participant interacts in various media environments. For example, participants were asked to report how often they "buy, sell or exchange virtual stuff on online forums, social networking platforms or online games".

Though intricate, this survey embodied a full range of media literacy skills as it assesses comfort with technical navigation but also explores the critical, social, and participatory components of online environments. The survey also demonstrated strong internal consistency ($\alpha = .81$). Responses for this measure were used to characterize the reported media literacy of the

participants and are summarized in Table 2. Overall, the sample displayed moderate levels of self-reported New Media Literacy, with the highest reported average levels in functional consumption skills. This is not surprising as this domain assessed the ability to find and understand the main idea of information online.

Table 2. *Descriptive statistics for New Media Literacy Scale (n = 37)*

New Media Literacy Scale	Minimum	Maximum	Mean	SD
Critical Consuming Analysis – Frequency	0.33	4.66	2.81	1.03
Critical Consuming Evaluation – Agreement	0.75	4.00	3.47	0.78
Critical Consuming Synthesis – Frequency	1.00	4.66	2.92	0.93
Critical Prosuming Participation – Agreement	1.40	4.20	2.72	0.64
Functional Consuming Understanding – Agreement	1.00	4.00	3.59	0.66
Functional Consuming Skills – Independence	1.00	2.37	2.01	0.26
Functional Prosuming Distribution – Frequency	0.80	4.60	2.75	0.95
Functional Prosuming Production – Frequency	1.00	4.75	2.67	0.98
Functional Prosuming Skills – Independence	1.05	2.96	2.13	0.48

Focus groups

In the initial visits to the classroom, small focus groups using specific interview protocol were conducted by student researchers with four groups of roughly eight students with one researcher leading each group. These focus groups were recorded and transcribed to gain an understanding of how participants use online environments to find information. The research team conducted these interview groups over the course of two weeks to fully capture the full scope of participants. A pre-set list of questions was outlined prior to focus group meetings; however, research assistants were instructed to let the conversation flow organically rather than force conformity with the questions if the comments remained relevant. The pre-determined questions were derived from New Literacies research on online reading and comprehension and included prompts regarding how often and for what purposes participants seek information online, how they decide what information is pertinent and trustworthy, and what they may find difficult during this process. Our research assistants also delved into asking participants about their experiences encountering information on social media and how they view and use information they read through these platforms. The focus group sessions culminated with a discussion of how the participants felt in terms of being supported in educational settings to find and use information found online.

Think-alouds

The classroom teacher assigned a final project in which students had to research and provide sources on a controversial topic for an oral presentation. During their initial search for sources, students were asked to participate in a think-aloud. All think-alouds were recorded and transcribed by the researchers using Otter.ai software then checked for reliability. Think-aloud protocols have been utilized in reading process research, particularly within the field of self-regulated reading to gain a deeper understanding of student processes (Hu & Gao, 2017). As online research processes rely in part on self-regulation strategies, employment of a think-aloud protocol allowed for deeper investigation into the strategies employed as one navigates information online (Wolf, 2007). Research assistants were instructed not to intervene in the think-aloud processes unless they needed to remind the participant to speak out loud for the recording device.

Coding and analysis

Transcripts from focus group and think-aloud sessions were coded to explore the initial research questions. Initial codes were developed using the framework for online research proposed by Leu and colleagues (2018) which outlined the component processes of online research. However, the researchers also allowed for open coding (Charmaz, 2011) to expand upon these initial process codes and to fully capture the extent of what the participants were doing in their online research processes. Thus, researchers conducted two separate coding sessions to begin, the first dissecting the data that was relevant to the pre-existing theory on adolescent online research process clearly outlined under the New Literacies conceptual framework, and a second to identify any secondary trends the data was

illuminating. In the second coding session, in accordance with researchers used open coding methodology which required multiple pass-throughs of the data to allow for maximum generation of potential codes. Researchers provided sample quotations for each code in the first iteration of the codebook. After this initial open coding session, the researchers met to categorize these codes to collapse them into larger themes with smaller sub-codes. Here, the codebook was finalized to fully capture the codes from the open coding session as well as the initial codes identifying the five practices on online research outlined by Leu and colleagues (2018), including identifying a problem, locating information, evaluating source material, synthesizing multiple sources of information and communicating information. All coding was done through Dedoose software version 9.09.46.

Trustworthiness

Transcripts were checked for reliability and accuracy by at least two researchers prior to coding. After generation of the final codebook, transcripts were analyzed by at least two researchers to ensure credibility using inter-rater reliability tests through Dedoose software. Reliability tests were used to ensure clarity in the codebook and in application. Any disagreements as to code applications were discussed and rectified to ensure maximum reliability.

FINDINGS

The first focus group solidified the nearly ubiquitous nature of digital technology for adolescents both in and out of academic settings. Harry, a male student participant, responded to a prompt from the researchers concerning how they read texts for school, stating,

> "I mean, everything's online. So, everything we're reading or doing for work is on computers anyway. So, if there's something that we have to read for like classwork, it's on the computer".

This statement underscored the importance of the investigation into adolescent online information processes, as they are continuously navigating digital information. From the focus group and think-aloud data, themes were identified that illuminated multiple aspects of the online research processes of adolescents, including a nuanced discussion of their conceptualization of online literacies, including social media literacies, finding and evaluating information

online, and the role of schools in supporting these new literacies. Findings will be broken down according to research questions.

How do adolescents conceptualize literacy in online spaces, including social media, specifically in terms of consuming information online?

The participants did conceptualize their online activities as literacy practices and acknowledged how often they read on their devices. One student, Naomi, indicated that when she became interested in a topic, she often searched for hours on her phone, and received digital articles from friends and family. These practices were agreed upon by the group as reading, and many students referred to reading this way for schoolwork as well as personal interests. However, when discussing viewing social media, most teens specifically referred to TikTok, with Naomi stating, "it's more like mindless watching than reading". During this conversation, another student, Sam, interjected that even though it's just watching, "it is definitely a place to find a lot of misinformation". Though adolescents are spending a lot of time online through their devices, they appear to conceptualize only certain activities as literacy practices and relegate other practices, like surfing social media to be recreational. The acknowledgement of misinformation through social media seems to imply a nuanced understanding of a hierarchy of online information. When faced with information on TikTok, Sam said

> "There are very few things that I read that I will take a face value, if anything, because there's always some kind of a skew in either direction".

Students referred to "dangers' on social media stemming from people being able to post anything and the potential for individuals to be misled by these posts, with one participant, Johanna stating, "I've seen a lot of people repost things that are just like, not factual. And they just think that it's factual, because like, all of their friends have already reposted it". Other participants echoed this idea, demonstrating an understanding of how information spreads on social media and the lack of fact-checking and vetting that may lead to misinformation.

Another concept that arose in all the focus groups was algorithms and echo chambers of information. Though the students mostly referred to this within the context of product exposure, a few did address the

potential dangers of information exposure limited by algorithms. This danger is best summed by Jaden's assessment:

"I think it's [the algorithm] necessary in order for social media to be entertaining, because otherwise, you'd just be saying a lot of random things, but I think it's very unethical when it's used in regard to like, political beliefs, or, like things like that."

Though not using social media sites directly for information, in the think-alouds, many individuals tried to counter-act the algorithm and curated information by running searches on Twitter and non-scholarly sources to see what others were saying about their controversial topics above their initial search. Matthew supplied,

"[…] if you get some information from the media. I mean, I would also try to see if I could find anything college students are actually seeing and what are your opinions on it? So like for that if I can find actual, like blogs that are under their name, like either on social media or like, just something that quotes them from like a school perspective".

One participant isolated the importance of understanding the literacy aspect of social media, commenting

"it [understanding social media] would also help kind of navigate that [Instagram and TikTok] critically, because you are seeing and looking at the posts from other angles and investigating. It is like, critical thinking and that is always a good skill to have".

Though students did not clearly view social media usage as an academic literacy practice, it is clear they are applying literacy skills within these contexts and that they have a nuanced understanding of these platforms as modes of information and communication.

How do adolescents seek information online when unguided, specifically how do adolescents evaluate online sources for credibility, bias, perspective, and utility?

Data pertaining to this research question was derived partially from the focus group discussions but was examined more authentically as researchers observed and recorded individual students finding information online. Students reported a clear set of criteria when evaluating information that seemed formulaic and may have spoken to prior media literacy instruction. These criteria were cited often, and students were not always able to supply reasons behind their imposed rules. For example, in the focus group students identified certain

immediate flags they look for when making credibility judgements on a source. Naomi stated,

"I oftentimes will have to look things up for school projects, and I usually look for.org or dot coms, if I can to make sure that I'm getting truthful information. But if I'm just kind of reading with the drama website are not really that important. It's just about whatever's convenient."

Nearly every think-aloud recording captured students discussing the website domain as one of their first indications of website trustworthiness, with 32 of the 37 participants referring to this strategy throughout their process. Interestingly, a few of the students were aware of this potentially unsubstantiated strategy, with one student, Melissa, stating, "the first thing I'm probably going to look at is the first thing that pops up because it is a '.org' website and I have been brainwashed to think that that is means it's legit.". In this statement, it can be inferred that the student is acknowledging they have learned the strategy but are not confident in its validity. Most of the participants who referred to this checkpoint as a method of checking for credibility underscored that they had learned this from a teacher earlier in their academic career, with one student, Ben, stating "it was kind of shoved down our throats of how to correctly research thing… I have received a lot of the same information, like over and over". Though Ben did not elaborate, there were a few of these research rules that were apparent in the discussion, including identifying the website domain.

Another part of this criteria the students adhered to was clear indication that a source explicitly cited outside references. While searching for initial sources for her topic, Melissa stated,

"I found the procon.org, which I really like. It shows both sides. Just different pros and cons to it. So helpful […] if you click one […] it brings you to like, where they got the information from, sort of footnotes, and their sources are in here. From all the different places they're getting their pros and their cons from. So kind of cuts down all the extra reading".

Though this is typically a strong strategy, Melissa also acknowledged she were not going to do the reading or check on the references herself. This issue arose in other think-aloud sessions, with most participants satisfied with simply seeing a list of references or footnotes in their sources as proof of reliability.

Interestingly, participants revealed a nuanced understanding of media perspectives and source evaluation, particularly as these issues relate to

prevalent societal issues. Johanna offered her perspective on encountering certain websites:

"[…] It's like, I try to keep in mind what the motivations are people who are running the news companies, so like, you have to really keep in mind like, if there's a publication that is sponsored by like the NRA and they're writing about gun control, will probably be skewed or if there's, if people are affiliated with a certain political party or even like just, just any kind of funding or like, affiliation needs to be kept in mind, because that creates bias."

Again, Johanna referred to the website domain rule, and admitted she felt websites with ".gov" or ".org" to be less biased than ".com" sources because they are written by established groups. Again, many students did not discuss more investigation after checking the website domain ending and concluding it to be less biased and ore trustworthy as a result.

Lastly, students did have a preliminary understanding of lateral reading, though never mentioned this strategy by name. There were numerous instances of students opening separate tabs to check on statistics and other numbers. For example, while researching gun violence Michael stumbled upon statistics and said,

"I would take that number, probably write it down […] and then I go to a different website and find another websites gun deaths for the same year, and just compare to make sure I'm getting the right number".

This strategy was well-documented in most of the think-alouds, though the participants did not apply lateral reading beyond checking statistics, which may indicate a limited understanding of the strategy. This finding highlighted a potential struggle utilizing multiple sources and synthesizing information across these sources.

What is the role of the school in supporting online research practices and literacies?

Students in the focus groups were asked how schools have supported literacy processes in online spaces, which generated lively discussions across the four sessions. Data from the think-alouds supported curriculum including the teaching of initial strategies, such as assessing website domains and checking for sources, though not all the participants who mentioned these strategies directly stated that they learned these strategies in the classroom. One finding that clearly emerged across all of the focus groups was the thought

that teaching new literacies was a clear responsibility of the schools, particularly individual teachers, with one female student, "L" stating outright,

"I think like teachers are probably the biggest, like, have the biggest influence on kids, because they're the people that are teaching kids how to, you know, are teaching kids all these skills that they need for life and all this knowledge that they need".

Interestingly, a few students further acknowledged some subjects as not rooted in media literacy, specifically math, with one student, Jose, stating "you really don't need to complicate things. Like, it's good to know how to do things without using the internet". This discussion indicated a clear direction for the subjects students felt lent themselves for media literacy instruction, naming English, social studies, and electives.

However, another female student, Shana stated "most people already know how to like do and open a tab or go to Google Classroom and like, do their homework or whatever, but they don't really teach us that [information literacy]". The participants were in 12th grade and felt acutely that they were already supposed to have these digital navigation and evaluation skills in place. They conceptualized the awareness of having to be critical when navigating sources but felt they did not get that support in school. In a separate focus group, similar sentiments were expressed as another student, James said "In computer class, it was only like, focused on not trusting things that come off Wikipedia and Facebook, and stuff like that". These experiences taken together speak to basic media literacy instruction but shows the glaring lack of more critical discussions regarding evaluating online information despite student interest and need.

Students also had faith in their teachers' ability to teach these skills, despite their perception of being more technologically savvy. The participants felt teachers were knowledgeable, but needed to stay current on new literacies. Elise mentioned,

"I think that a lot of teachers have really good, like a pretty good handle on, like, traditional, like, meaning consumption of like, how to find sources or like how to read an article and find what you need out of it. But there needs to be more. Like they, for the most part, don't really know a lot about like, more current ways that media is consumed. I think it'd be helpful if like that was maybe like, taught to them somehow. So, they can more easily understand like the way that information is gathered".

James, who had previously discussed his lack of deeper media literacy also interjected in this conversation adding,

"I think that a lot of people that are teaching about how to properly research and read things and decipher whether it's credible, aren't actually properly versed, and don't spend enough time in those spaces where there's that propaganda or those biases, discussions and all of those different things [...] [media literacy] is not something you can just like, read about and teach, it's something you have to personally experience".

This nuanced understanding of the changing nature of literacy skills was profoundly clear throughout the focus groups and underscored the intricacies of incorporating new literacies instruction in the classroom. These students clearly trusted their teachers but questioned their ability to meet the changing nature of digital spaces efficiently. Another student, Jane, noted

"I feel like they [teachers] do value literacy and that kids of literacy [media literacy], and they attempt to teach it, but they don't realize the depth of the social aspect of it."

Deeper in the discussion, Jane made more connections with educators and schools not teaching anything related to social media and even dismissing social media use in general. Though this discussion was fairly neutral, it did show that these students were aware of the line between their in and out of school literacy practices, specifically as this relates to social media usage. It was clear the participants did not view social media content as academic in nature and did not discuss social media education in schools. Though there was not a clear academic tie to social media, many participants highlighted the dangers of social media, particularly focused on falling for false information, privacy issues, and online safety. These comments were pervasive throughout all four focus groups and seemed to indicate a need for support regarding social media skills but fell short of demanding this type of instruction in school.

The participants were asked to discuss the times they received media literacy instruction and what age they felt was appropriate to being. The students felt that new literacies instruction related to teaching media literacy skills should begin earlier than high school. Naomi stated,

"it should be taught like as early as possible because people just need to process what they're consuming like people are being introduced to the internet at such a ridiculously young age that if they don't know how to correctly like navigate it. It's just a

bunch of like, dead ends in their brain that are gonna keep piling up like forever".

Naomi synthesized what many of her classmates were stating, that understanding information found online is difficult and when they were left to do this independently, and without instruction, they felt they were lacking. This also sums up a concern many of the students put forth, that the younger generation is not learning these skills and will not be critically conscious of the information they are consuming.

DISCUSSION

Participants very clearly conceptualized their understanding of literacy practices online, acknowledging the vast amount of information available online and the prevalence of online texts in their daily lives. Student responses in the focus groups, think-aloud sessions, and through observations thoroughly underscored the divide between students in and out of school literacies and the separation the students perceived between the two. Students clearly referred to social media as an out of school practice and explicitly understood that schools were not necessarily supportive of these platforms. The data obtained for this study was limited as we were not able to specifically walk through information processes on social media with students during the think-aloud sessions because of the blocks on these platforms. Analyzing these processes in future studies may be an important area of research to fully illuminate what adolescents are doing on these platforms and how educators and other adults may support these processes. The connection between students out of school literacies, including their use of social media for information, and the potential for schools to support these literacies to bolster traditional literacy skills has been well discussed in the literature.

The findings pertaining to the process of adolescent online research were robust, particularly as the researchers were able to observe these processes in authentic and unguided settings. In line with extant research, participants almost unanimously discussed superficial strategies such as trusting websites ending in ".edu" or ".gov" over ".com" sites and checking the visual components of a website in the focus groups and within their think-alouds (Metzger et al., 2010; Metzer & Flanagin, 2015). This also was true when students were able to locate citations within a source, leading to a sense of trustworthiness. However, when students rely on these strategies without further investigation, it may

lead them to a false sense of credibility and prohibit further exploration. These strategies, though strong, should be taught within a deeper context to ensure that students are doing their due diligence when finding information online, rather than simply making a judgement based on visuals.

A limited understanding of synthesizing information across multiple sources may underlie students struggles with lateral reading, despite their understanding of the necessity of fact-checking information found in sources. Saux, Britt, Vibert, and Rouet. (2021) outlined the complex cognitive processes underlying utilizing multiple sources that go above traditional reading comprehension. Though not specifically pertaining to online settings, the researchers identified multiple understandings that must be in place for students to fully comprehend and synthesize information across sources, including thorough task understanding. As the assignment for the participants' particular class was open-ended, and students were allowed to create their own presentation parameters, they may potentially lack the background knowledge to fully comprehend and synthesize multiple sources. For example, one student was researching critical race theory in schools and did not have a firm grasp on the content while they were conducting their search for information. They continuously struggled to define the term and therefore seemed to have difficulty solidifying sources. Searching for the content information may have detracted from the credibility and lateral reading processes.

Additionally, many of the shortcomings in terms of assessing bias and shallow lateral reading may be a result of lack of understanding the creation aspect of new literacies, specifically within the domain of media literacy. According to Ku et al. (2019), knowledge of media and online text production was related to more critical analysis of sources. This can be particularly true in social media contexts, where students have more opportunities for creation both in and out of school and may help them to gain an understanding of potential limitations of information found through these platforms. When students discussed information found through social media, they often acknowledged the faultiness of information shared by others, which may support this idea. This study was exploratory in nature and utilized data directly from student narratives. Though recorded, it may be beneficial to screencast these think-alouds and more fully analyze what students are doing in their online searches above observational data.

Finally, students felt strongly about incorporating new literacies in the classroom, emphasizing the need for these skills as they progressed through school. This also led to discussion about implementing this type of instruction earlier to ensure formation of good literacy habits and less likelihood of being wooed by misinformation online. The key takeaway here was that students felt these skills to underlie their future success and be foundational for them both in and out of academic settings, particularly as they identified dangers of not having these skills. The student participants also clearly identified a need for teachers to be well-trained in new literacies and continuously update their understanding. This is especially important as we begin to navigate artificial intelligence for information and for generative purposes. Teachers should have an up-to-date understanding of the digital landscape to fully prepare students for literacy practices they will face outside of the classroom.

Bringing a more comprehensive literacy curriculum, with specific inclusion on the skills that underlie online research and digital sources, may help to bridge the gap and create a more applied setting for literacy skills. Many nations, particularly European nations, have included an expanded literacy curriculum as part of typical language and literacy instruction. In fact, in a meta-analysis of effective media literacy curriculum internationally, Zhang, Zhang, and Wang (2020) found that most European literacy curriculum maps included a media creation component to further develop understanding of media practices from a critical lens. These practices also support life-long learning skills students can apply in post K-12 settings, further bridging the perceived divide between in and out of school literacies (Blaschke, 2017).

This study attempted to illuminate the processes students experience when searching for information authentically to ascertain their educational needs as well as their learning values. Insight gained from the students' narratives and metacognitive data was especially fruitful in granting access to perspectives that are often silenced by contemporary curriculum and allowing them to fully voice their needs as technology continues to change.

REFERENCES

Abendroth, J., & Richter, T. (2020). Text-belief consistency effects in adolescents' comprehension of multiple documents from the Web [El efecto de consistencia en la comprehension lectora de los

adolescentes de documentas multiples provenientes de Internet]. *Journal for the Study of Education and Development/Infancia Y Aprendizaje, 43*, 60-100. https://doi.org/10.1080/02103702.2019.1692289

Alvermann, D. E. (2022). *Best practices in adolescent literacy instruction*. Guilford Publications.

Alvermann, D. E., & Sanders, R. K. (2019). Adolescent literacy in a digital world. *The international encyclopedia of media literacy*, 1-6.

Austin, E. W., Borah, P., & Domgaard, S. (2021). COVID-19 disinformation and political engagement among communities of color: The role of media literacy. *Harvard Kennedy School Misinformation Review*. https://doi.org/10.37016/mr-2020-58

Bell, B. T., Taylor, C., Paddock, D., & Bates, A. (2022). Digital Bodies: A controlled evaluation of a brief classroom-based intervention for reducing negative body image among adolescents in the digital age. *British Journal of Educational Psychology*, *92*(1), 280-298. https://doi.org/10.1111/bjep.12449

Bhatt, & MacKenzie, A. (2019). Just Google it! Digital literacy and the epistemology of ignorance. *Teaching in Higher Education*, *24*(3), 302-317. https://doi.org/10.1080/13562517.2018.1547276

Blaschke, L. M. (2018). Self-determined learning (heutagogy) and digital media creating integrated educational environments for developing lifelong learning skills. In *The digital turn in higher education: International perspectives on learning and teaching in a changing world* (pp. 129-140). Springer.

Braasch, J. L., Haverkamp, Y. E., Latini, N., Shaw, S., Arshad, M. S., & Bråten, I. (2022). Belief bias when adolescents read to comprehend multiple conflicting texts. *Reading and Writing*, *35*(8), 1759-1785. https://doi.org/10.1007/s11145-022-10262-w

Charmaz, K. (2011). *Constructing grounded theory: A practical guide through qualitative analysis*. Sage.

Cho, B.-Y. (2013). Adolescents' constructively responsive reading strategy use in a critical Internet reading task. *Reading Research Quarterly*, *48*(4), 329-332.

Cho, B. Y., & Afflerbach, P. (2015). Reading on the Internet: Realizing and constructing potential texts. *Journal of Adolescent & Adult Literacy*, *58*(6), 504-517.

Coiro, J. (2009). Rethinking online reading assessment. *Educational Leadership*, *66*(6), 59-63.

Coiro, J. (2011). Predicting reading comprehension on the Internet: Contributions of offline reading skills, online reading skills, and prior knowledge. *Journal of Literacy Research*, *43*(4), 352-392. https://doi.org/10.1177/1086296X11421979

Coiro, J., Coscarelli, C., Maykel, C., & Forzani, E. (2015). Investigating criteria seventh graders use to evaluate the quality of online information. *Journal of Adolescent & Adult Literacy,* *58*(7), 546-550. https://doi.org/10.1002/jaal.448

Coiro, J., Sekeres, D. C., Castek, J., & Guzniczak, L. (2014). Comparing the quality of third, fourth, and fifth graders' social interactions and cognitive strategy use during structured online inquiry. *Journal of Education, 194*(2), 1-15. https://doi.org/10.1177/002205741419400202

Colditz, J. B., Woods, M. S., & Primack, B. A. (2018). Adolescents seeking online health information: Topics, approaches, and challenges. *Technology and adolescent mental health*, 21-35.

de Valle, M. K., Gallego-García, M., Williamson, P., & Wade, T. D. (2021). Social media, body image, and the question of causation: Meta-analyses of experimental and longitudinal evidence. *Body Image*, *39*, 276-292. https://doi.org/10.1016/j.bodyim.2021.10.001

De Leyn, T., Waeterloos, C., De Wolf, R., Vanhaelewyn, B., Ponnet, K., & De Marez, L. (2022). Teenagers' reflections on media literacy initiatives at school and everyday media literacy discourses. *Journal of children and media*, *16*(2), 221-239. https://doi.org/10.1080/17482798.2021.1952463

Drummond, S. R., Mazon, N., Littleton, K., & Velez, M. (2014). Developing reading comprehension through collaborative learning. *Journal of Research in Reading, 37*, 138-158. https://www.doi.org/10.1111/j.1467-9817.2011.01526.x

Firth, J., Torous, J., Stubbs, B., Firth, J. A., Steiner, G. Z., Smith, L., Alvarez-Jimenez, M., Gleeson, J. Vancampfort, D., Armitage, C. & Sarris, J. (2019). The "online brain": how the Internet may be changing our cognition. *World Psychiatry*, *18*(2), 119-129. https://doi.org/10.1002/wps.20617

Fisher, D., & Frey, N. (2013). *Background knowledge: The overlooked factor in reading comprehension*. McGraw Hill Networks.

Forzani, E., Corrigan, J., & Kiili, C. (2022). What does more and less effective internet evaluation entail? Investigating readers' credibility judgments across content, source, and context. *Computers in Human*

Behavior, 135, 1-16.
https://doi.org/10.1016/j.chb.2022.107359

Fraillon, J., Ainley, J., Schulz, W., Duckworth, D., & Friedman, T. (2019). IEA International Computer and Information Literacy Study 2018. Amsterdam, The Netherlands. *Internacional Association for the Evaluation of Educational Achievement (IEA)*.

Freeman, J. L., Caldwell, P. H., Bennett, P. A., & Scott, K. M. (2018). How adolescents search for and appraise online health information: A systematic review. *The Journal of Pediatrics*, *195*, 244-255. https://doi.org/10.1016/j.jpeds.2017.11.031

Geers, S., Boukes, M., & Moeller, J. (2020). Bridging the gap? The impact of a media literacy educational intervention on news media literacy, political knowledge, political efficacy among lower-educated youth. *Journal of Media Literacy Education*, *12*(2), 41-53. https://doi.org/10.23860/JMLE-2020-12-2-4

Gordon, C. S., Jarman, H. K., Rodgers, R. F., McLean, S. A., Slater, A., Fuller-Tyszkiewicz, M., & Paxton, S. J. (2021). Outcomes of a cluster randomized controlled trial of the SoMe social media literacy program for improving body image-related outcomes in adolescent boys and girls. *Nutrients*, *13*(11), 3825. https://doi.org/10.3390/nu13113825

Guess, A. M., & Munger, K. (2023). Digital literacy and online political behavior. *Political Science Research and Methods*, *11*(1), 110-128. https://doi.org/10.1017/psrm.2022.17

Henry, L. A., Castek, J., O'Byrne, W. I., & Zawilinski, L. (2012). Using peer collaboration to support online reading, writing and communication: An empowerment model for struggling readers. *Reading & Writing Quarterly*, *28*(3), 279-306. https://doi.org/10.1080/10573569.2012.67643

Hobbs, R. (2019). Media literacy foundations. *The International Encyclopedia of Media Literacy*, 1-19.

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

Hobbs, R., Moen, M., Tang, R., & Steager, P. (2022). Measuring the implementation of media literacy instructional practices in schools: community stakeholder perspectives. *Learning, Media and Technology*, 1-16. https://doi.org/10.1080/17439884.2022.2151621

Hu, J., & Gao, X. A. (2017). Using think-aloud protocol in self-regulated reading research. *Educational Research Review*, *22*, 181-193. https://doi.org/10.1016/j.edurev.2017.09.004

International Literacy Association. (2019). *Engagement and adolescent literacy* [Position statement and research brief]. Newark, DE. https://www.literacyworldwide.org/docs/default-source/where-we-stand/ila-engagement-and-adolescent-literacy.pdf

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

Kohnen, A., Dawson, K., Mertens, G. (2022). Three continua of online credibility strategies used by eighth graders. *TechTrends, 66*, 643-653. https://doi.org/10.1007/s11528-022-00699-9

Ku, K. Y., Kong, Q., Song, Y., Deng, L., Kang, Y., & Hu, A. (2019). What predicts adolescents' critical thinking about real-life news? The roles of social media news consumption and news media literacy. *Thinking Skills and Creativity*, *33*, 100570. https://doi.org/10.1016/j.tsc.2019.05.004

Kurz, M., Rosendahl, J., Rodeck, J., Muehleck, J., & Berger, U. (2022). School-based interventions improve body image and media literacy in youth: A systematic review and meta-analysis. *Journal of Prevention*, *43*(1), 5-23. https://doi.org/10.1007/s10935-021-00660-1

Lee, L., Chen, D. T., Li, J. Y., & Lin, T. B. (2015). Understanding new media literacy: The development of a measuring instrument. *Computers & Education*, *85*, 84-93. https://doi.org/10.1016/j.compedu.2015.02.006

Lei, H., Xiong, Y., Chiu, M. M., Zhang, J., & Cai, Z. (2021). The relationship between ICT literacy and academic achievement among students: A meta-analysis. *Children and Youth Services Review*, *127*, 106123. https://doi.org/10.1016/j.childyouth.2021.106123

Leu, D. J., Kinzer, C. K., Coiro, J., Castek, J., & Henry, L. A. (2018). New literacies: A dual-level theory of the changing nature of literacy, instruction, and assessment. In *Theoretical models and processes of literacy* (pp. 319-346). Routledge.

Leu, D. J., Coiro, J., Castek, J., Hartman, D., Henry, L. A., & Reinking, D. (2008). Research on instruction and assessment in the new literacies of online reading comprehension. In C. C. Block, S. Parris, & P. Afflerbach (Eds.), *Comprehension instruction: Research-based best practices* (pp. 321-346). Guilford.

Loh, C. E., Sun, B., & Lim, F. V. (2023). 'Because I'm always moving': a mobile ethnography study of

adolescent girls' everyday print and digital reading practices. *Learning, Media and Technology*, 1-20. https://doi.org/10.1080/17439884.2023.2209325

Martínez-Bravo, M. C., Sádaba-Chalezquer, C., & Serrano-Puche, J. (2020). Fifty years of digital literacy studies: A meta-research for interdisciplinary and conceptual convergence. *Profesional de la información*, *29*(4), e290428. https://doi.org/10.3145/epi.2020.jul.28

McLean, S. A., Wertheim, E. H., Marques, M. D., & Paxton, S. J. (2019). Dismantling prevention: Comparison of outcomes following media literacy and appearance comparison modules in a randomised controlled trial. *Journal of Health Psychology*, *24*(6), 761-776. https://doi.org/10.1177/1359105316678668

Metzger, M. J., Flanagin, A. J., & Medders, R. B. (2010). Social and heuristic approaches to credibility evaluation online. *Journal of Communication, 60*, 413-439. https://doi.org/10.1111/j.1460-2466.2010.01488.x

Metzger, M. J., & Flanagin, A. (2015). Psychological approaches to credibility assessment online. In S. S. Sundar (Ed.), *The Handbook of the Psychology of Communication Technology* (pp. 445-465). John Wiley & Sons. https://doi.org/10.1002/9781118426456.ch20

Metzger, M. J., Flanagin, A. J., Markov, A., Grossman, R., & Bulger, M. (2015). Believing the unbelievable: understanding young people's information literacy beliefs and practices in the United States. *Journal of Children and Media*, *9*(3), 325-348. https://doi.org/10.1080/17482798.2015.1056817

Mingoia, J., Hutchinson, A. D., Gleaves, D. H., & Wilson, C. (2019). The impact of a social media literacy intervention on positive attitudes to tanning: A pilot study. *Computers in Human Behavior*, *90*, 188-195. https://doi.org/10.1016/j.chb.2018.09.004

Nagle, J. (2018). Twitter, cyber-violence, and the need for a critical social media literacy in teacher education: A review of the literature. *Teaching and Teacher Education*, *76*, 86-94. https://doi.org/10.1016/j.tate.2018.08.014

Paxton, S. J., McLean, S. A., & Rodgers, R. F. (2022). "My critical filter buffers your app filter": Social media literacy as a protective factor for body image. *Body Image*, *40*, 158-164. https://doi.org/10.1016/j.bodyim.2021.12.009

Saux, G., Britt, M. A., Vibert, N., & Rouet, J. F. (2021). Building mental models from multiple texts: How readers construct coherence from inconsistent sources. *Language and Linguistics Compass*, *15*(3), e12409. https://doi.org/10.1111/lnc3.12409

Schreurs, L., & Vandenbosch, L. (2021). Introducing the Social Media Literacy (SMILE) model with the case of the positivity bias on social media. *Journal of Children and Media*, *15*(3), 320-337. https://doi.org/10.1080/17482798.2020.1809481

Scolari, C. A. (2019). Beyond the myth of the "digital native" Adolescents, collaborative cultures and transmedia skills. *Nordic Journal of Digital Literacy*, *14*(3-04), 164-174. https://doi.org/10.18261/issn.1891-943x-2019-03-04-06

Tamboer, S. L., Kleemans, M., Molenaar, I., & Bosse, T. (2023). Developing a model of news literacy in early adolescents: A survey study. *Mass Communication and Society*, *26*(1), 74-98. https://doi.org/10.1080/15205436.2022.2048027

Tilleul, C. (2023). Young adults' social network practices and the development of their media literacy competences: A quantitative study. *Information, Communication & Society*, *26*(10), 2107-2125. https://doi.org/10.1080/1369118X.2022.2072751

Turner, K. H., Hicks, T., & Zucker, L. (2020). Connected reading: A framework for understanding how adolescents encounter, evaluate, and engage with texts in the digital age. *Reading Research Quarterly*, *55*(2), 291-309. https://doi.org/10.1002/rrq.271

Vogels, E. A., Gelles-Watnick, R., & Massarat, N. (2022). Teens, social media and technology. *Pew Research Center.* https://doi.org/10.1002/jts.22640

Volpe, V. V., Willis, H. A., Joseph, P., & Tynes, B. M. (2021). Liberatory media literacy as protective against posttraumatic stress for emerging adults of color. *Journal of traumatic stress*, *34*(5), 1045-1055.

Walsh-Moorman, B., & Pytash, K. E. (2022). Guiding their thinking: A formative study of digital source evaluation. *Journal of Adolescent & Adult Literacy*, *65*(6), 469-479. https://doi.org/10.1002/jaal.1225

Washburn, J., & Myers, S. (2023). Adolescents' perspectives about their digital and connective literacies. *Journal of Adolescent & Adult Literacy*, *67*(1), 12-21. https://doi.org/10.1002/jaal.1300

Wineburg, S., & McGrew, S. (2019). Lateral reading and the nature of expertise: Reading less and learning more when evaluating digital information. *Teachers College Record*, *121*(11), 1-40. https://doi.org/10.1177/016146811912101102

Wolf, S. (2007). Information literacy and Self-regulation: A convergence of disciplines. *School Library Media Research*, *10*.

Wusylko, C., Boehm, S., Dawson, K., & Kohnen, A. (2022). Adolescent social media information literacy outside of school: A scoping review of the literacy and educational technology literature. *Journal of Educational Technology Systems*, *51*(1), 89-107. https://doi.org/10.1177/00472395221110567

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

Zhang, L., Zhang, H., & Wang, K. (2020). Media literacy education and curriculum integration: A literature review. *International Journal of Contemporary Education*, *3*(1), 55-64. https://doi.org/10.11114

Zimmerman, M. S. (2021). Health information-seeking behavior in the time of COVID-19: information horizons methodology to decipher source path during a global pandemic. *Journal of Documentation*, *77*(6), 1248-1264. https://doi.org/10.1108/JD-01-2021-0022