How to teach students critical thinking skills to combat misinformation online

Psychologists are a key part of the push to equip students with skills to identify falsehoods and recognize content intended to manipulate

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Key points

- There's a movement afoot to equip K–12 students with the skills they need to identify misinformation on social media.
- Psychologists are a key part of the effort to help youth build digital literacy skills and create science-backed digital literacy tools for educators.
- Efforts to improve digital literacy among youth will help protect the next generation from the spread of false information online and guide youth on how to use social media safely.

At least 21 state legislatures have taken steps to reform K–12 media and information literacy education (https://medialiteracynow.org/impact/current-policy/) , with California, Delaware, Illinois, and New Jersey passing comprehensive reforms (U.S. Media Literacy Policy Report, *Media Literacy Now*, 2024 (https://medialiteracynow.org/policyreport/)). The largely bipartisan efforts are a response to challenges that most school curriculums do not yet address or teach—skills like sorting out what is true or false online, identifying when content is produced by artificial intelligence (AI), and how to use social media safely.

"We've all seen how the spread of online misinformation and disinformation is growing and that it has real-world consequences," said Assemblymember Marc Berman, JD, an attorney who represents California's 23rd District and spearheaded the state's digital literacy education law. "I can't force adults to go back to school and take media literacy, but at a minimum, we can make sure that our young people are getting the skills they need for today's world."

People of all ages are susceptible to misinformation, but youth—who spend an average of 4 to 6 hours per day online—say they need help (https://www.scientificamerican.com/article/young-people-tell-us-they-need-help-identifying-misinformation/) . In one survey of young adults in Canada, 84% were unsure they could distinguish fact from fiction on social media (*Youth Science Survey*, Canada Foundation for Innovation, 2021 (https://www.innovation.ca/projects-results/current-topics-research-funding/youth-

research-promising-future)). In a study led by educational psychologist Sam Wineburg, PhD, 82% of middle school students could not tell the difference between an online news story and an advertisement (*Evaluating Information: The Cornerstone of Civic Online Reasoning*, Stanford Digital Repository, 2016 (https://purl.stanford.edu/fv751yt5934)).

"It's those kinds of findings that have gotten the attention of legislators," said Wineburg, who is an emeritus professor at Stanford University and cofounder of the Digital Inquiry Group (https://inquirygroup.org/) (DIG), a nonprofit that creates free research-backed digital literacy tools for educators.

"Increasingly, as young people's apps of choice are TikTok and YouTube, the adults have woken up to the fact that quality information is to civic understanding what clean air and water are to civic health," Wineburg said.

The most comprehensive programs, which are now being developed and tested for K–12 audiences, also aim to teach students how to locate and assess the source of online information and to think critically about how generative AI produces content. They also teach students about digital citizenship, which involves engaging respectfully with others online.

Psychologists are a key part of those efforts. In its 2023 Health Advisory on Social Media Use in Adolescence (/topics/social-media-internet/health-advisory-adolescent-social-media-use) , APA recommended psychologically informed media literacy training for youth, guidance echoed by U.S. Surgeon General Vivek H. Murthy. What is needed now is ongoing research on what works, as well as strong collaboration with journalists, educators, and policymakers to swiftly put research insights into practice.

This year, APA also released an updated scientific roundup focused on the risks of social media content, features, and functions (/topics/social-media-internet/youth-social-media-2024) . The report also provides concrete recommendations for minimizing psychological harm, including tips for monitoring use.

"To me, this is really one of the most important things we can be doing right now as psychologists, given how misinformation has made science political in ways that are really frightening," said Susan Nolan, PhD, a professor of psychology at Seton Hall University in New Jersey who studies and advocates for scientific literacy.

Media literacy reform

While social media platforms typically require users to be 13 or older, most adolescents create accounts before then, at a time when their brains are particularly vulnerable (/news/apa/2022/social-media-children-teens) to social influence (*The Common Sense Census: Plugged-In Parents of Tweens and Teens*, Common Sense Media, 2016 (https://www.commonsensemedia.org/research/the-common-sense-census-plugged-in-parents-of-tweens-and-teens-2016)). In addition to the interpersonal risks of getting online, surveys show that adolescents are more likely to believe conspiracy theories than adults—particularly those adolescents who spend a lot of time on social media ("Belief in conspiracy theories higher among teenagers than adults, as majority of Americans support social media reform, new polling finds (https://counterhate.com/blog/belief-in-conspiracy-theories-higher-among-teenagers-than-adults-as-majority-of-americans-support-social-media-reform-new-polling-finds/) ," Center for Countering Digital Hate, August 16, 2023).

"Media literacy is literacy in the 21st century, and we don't start teaching literacy in high school," said Erin McNeill, founder and CEO of Media Literacy Now (https://medialiteracynow.org/) , an organization dedicated to K–12 media literacy reform. "It's an essential life skill that has to be built on a foundation, not rolled out at the last minute."

Psychological research has played an important role in demonstrating the need for starting media literacy training early and in passing corresponding educational reforms at the state level. In a 2021 study by Wineburg and his colleagues, 3,446 census-matched high school students were tasked with investigating a website, CO2 Science (http://www.co2science.org/) , and evaluating whether it provided reliable information about human-induced

climate change. Only 4% of students discovered that the site's chief sponsor was ExxonMobil (*Educational Researcher*, Vol. 50, No. 8, 2021 (https://doi.org/10.3102/0013189X211017495)).

More than half of the students in the study also believed that a Facebook video that appeared to show ballot stuffing, shot in Russia and posted anonymously, was "strong evidence" of U.S. voter fraud.

"We leaned on these studies when justifying the legislation because they show how the internet and social media make it a lot easier to select only the information that supports our preexisting beliefs, rather than providing a more balanced view," said Berman, who also pointed to APA's 2023 Health Advisory on Social Media Use in Adolescence to support the need for policy reform.

Drawing on psychological research, APA's latest guidance (/topics/social-media-internet/youth-social-media-2024) recommends a series of digital literacy competencies that can provide a starting point for policymakers. Those include understanding the tactics used to spread mis- and disinformation, limiting overgeneralizations that lead people to incorrectly interpret others' beliefs, and helping young people learn to nourish healthy online relationships.

"Developmentally, adolescents are especially vulnerable to the features of social media that are designed to keep users online, such as likes, push notifications, autoplay, and algorithms that deliver extreme content," said Sophia Choukas-Bradley, PhD, an associate professor of psychology at the University of Pittsburgh who contributed to both APA reports. "As psychologists, we need to provide teens with digital literacy and skills to combat these design features while simultaneously pushing for policies that require tech companies to change the platforms themselves."

With legislation now in place, New Jersey's Department of Education is crafting its detailed information literacy standards, drawing on APA's Resolution on Combating Misinformation and Promoting Psychological Science Literacy (PDF, 53KB) (/about/policy/combating-misinformation-promoting-literacy.pdf) in the process. The curriculum will include training on such topics as the scientific

method, the difference between primary and secondary sources, how to differentiate fact from opinion, and the ethical production of information (including data ethics).

“When you look at what is in the curriculum, really all of it ultimately ties to psychology,” Nolan said about the New Jersey law.

Progress at the state level is meaningful, but mandates do not necessarily equal action. It can take years for state educational boards to develop and implement curriculum reforms, especially if research has not clearly shown what works.

“It’s one thing to pass a law, but it’s quite another to develop and fund evidence-based professional development programs for teachers, many of whom do not feel up to this task” without further training, Wineburg said.

Equipping and empowering youth

Policymakers, educators, librarians, and even journalists are putting their heads together to decide what and how to teach media literacy to kids and teens. But those on the front lines also stress the importance of sound science that can guide the development of interventions from the get-go.

“What happens often in K–12 education is we get separated from the research,” said Kathryn Procope, EdD, executive director at Howard University Middle School of Mathematics and Science in Washington, D.C. “Getting connected with what the research says can help educators sit down collectively and decide what we’re going to do” when new challenges arise.

DIG offers one solution: its Civic Online Reasoning (https://cor.inquirygroup.org/) program, a free curriculum that teaches lateral reading—a fact-checking method where readers evaluate source credibility, such as by searching for background in a separate browser tab. The program also teaches skills such as click restraint, the strategy of looking past the first results suggested by search engines to results from more credible sources.

“Behind lateral reading is the idea that we need to think about online information in a fundamentally different way,” Wineburg said. “Rather than immediately looking at the claim, we want people asking: Who is the person or the organization behind this claim?”

Studies of lateral reading interventions show that they can change the way young people interact with information online. Students who completed six 50-minute lessons in a field study across six Lincoln, Nebraska, high schools were significantly more accurate in assessing source credibility than their peers who did not get the intervention (*Journal of Educational Psychology*, Vol. 114, No. 5, 2022 (https://doi.org/10.1037/edu0000740)). In Canada, 2,278 middle and high school students completed the CRTL-F lateral reading program. Beforehand, only 6% could identify the agenda of an advocacy group, but that number rose to 31% after the intervention and to 49% 6 weeks later (Brodsky, J. E., et al., *AERA Open*, Vol. 9, 2023; (https://doi.org/10.1177/23328584231192106) *The Digital Media Literacy Gap*, CIVIX Canada, 2021 (https://ctrl-f.ca/en/wp-content/uploads/2022/01/The-Digital-Media-Literacy-Gap.pdf)).

Research conducted in Germany and Italy also found that lateral reading helped news consumers identify false information online, and that pop-up reminders and monetary incentives can increase the practice of lateral reading and click restraint (Fendt, M., et al., *Computers in Human Behavior*, Vol. 146, 2023

(https://doi.org/10.1016/j.chb.2023.107820) ; Panizza, F., et al., *Scientific Reports*, Vol. 12, 2022 (https://doi.org/10.1038/s41598-022-09168-y)).

Choukas-Bradley is working with the Center for Digital Thriving (https://digitalthriving.gse.harvard.edu/about/) at Harvard Graduate School of Education and Common Sense Media to develop and evaluate resources that educate adolescents about the social media features designed to keep them online, as well as to teach cognitive and behavioral techniques that promote healthier social media use.

"We listen closely to students and then trace the connections to key evidence-based practices," said Emily Weinstein, EdD, cofounder of the Center for Digital Thriving, which offers resources codesigned by educators, students, and clinical psychologists (https://digitalthriving.gse.harvard.edu/resources/thinking-traps/) .

For example, teens share common thinking traps (PDF, 130KB) (https://digitalthriving.gse.harvard.edu/wp-content/uploads/2024/03/THINKING-TRAPS-GLOSSARY.pdf) that are amplified by tech, such as "everyone on social media is happier than me," or "my friend must be mad if they haven't responded to my Snap." Both are examples of cognitive distortions, for which psychologists have a robust evidence base.

"There's real power in the idea that 'if you can name it, you can tame it,' which is one reason we want every student to know about common thinking traps," Weinstein said.

Educators and researchers are aware of the irony behind adults teaching digital natives how to use platforms with which they are already intimately familiar. For that reason, some are working with kids and teens to teach digital literacy in ways that are meaningful to them.

"Students are far ahead of educators when it comes to using new technologies, so the more that young people are involved in the design of the curriculum that will be used to teach media literacy in 2024 and beyond, the better," said

Chelsea Waite, a principal investigator at the Center on Reinventing Public Education at Arizona State University's Mary Lou Fulton Teachers College who studies innovative practices at K–12 schools across the United States.

DIG has partnered with Microsoft to integrate information literacy quests (https://education.minecraft.net/en-us/lessons/the-investigators) that focus on exploring bias and persuasion—for example, when information is trustworthy enough to be shared with others—into the video game Minecraft. Mizuko Ito, PhD, a cultural anthropologist who has studied youth-centered learning for years and directs the Connected Learning Lab at the University of California, Irvine, coleads the Connected Learning Alliance (https://clalliance.org/) , which fosters partnerships between researchers, developers, and youth to generate new technologies that prioritize connection and well-being rather than profit. One of the organization's latest projects, Connected Camps (https://connectedcamps.com/) , pairs 8- to 13-year-old gamers with college gamers to learn about digital citizenship and to become part of a prosocial online community.

"We know that it's so much more effective to do online literacy learning and skills development within the context of something youth actually care about, like the gaming universe," Ito said.

Other youth media organizations are leveraging content young people care about to equip and empower them to create positive online spaces. The This Teenage Life (https://thisteenagelife.org/) podcast, for example, is a school-based program that teaches kids to produce a podcast while thinking critically about how to engage with today's digital ecosystem and be a good citizen online.

"As educators, we have to remember that young people nowadays are going to ask: Why am I learning this? It doesn't have anything to do with what I care about," Procope said. "That means that we have to do what we're doing a lot differently."

*[**Related:** New approaches to AI in the K–12 classroom (/monitor/2024/09/new-*

approaches-ai-classroom)]

From the ground up

The online world has wrought so much change that many experts say education must fundamentally change, too.

"Right now, the approach is to treat information literacy as a patch to put on the whole of the curriculum," Wineburg said. "But really the challenge, when students are leading digital lives, is to fundamentally rethink the entire curriculum we have."

That's a tall order, but a starting point is to interweave digital and media literacy lessons throughout multiple courses rather than treat the subject as a separate entity. For example, a high school biology lesson about vaccines will be more meaningful to students if it acknowledges and addresses the pseudoscientific information they see daily on TikTok, such as the supposed health benefits of castor oil, Wineburg said. Another idea: Students can learn about the strengths and weaknesses of ChatGPT in a history class by asking questions about a historical event where the facts are unclear, such as who fired the first shot in the Battle of Lexington, the first volley in the Revolutionary War.

"Whether it's debunking pseudoscience on social media or understanding the nuances of AI in history class, every subject offers an opportunity to cultivate these skills," said Nicole Barnes, PhD, senior director of APA's Center for Psychology in Schools and Education (/ed/schools) (CPSE). "After all, we're not just preparing students for exams but for life in a digital world. This is exactly what we are doing in the CPSE—providing pre-K–12 educators with teaching and learning resources that are grounded in psychological science."

Several states are aiming for such integration by giving librarians a central role in administering media literacy training throughout schools. The International

Society for Technology in Education (https://iste.org/) (ISTE) also recommends a comprehensive approach to K–12 training on technology and online media.

"The people leading these efforts—from national organizations to state legislators—are starting to see this as something that needs to be integrated throughout the entire curriculum," McNeill said.

The top priority now is to provide states, districts, and schools with packaged materials that have been vetted by peer-reviewed research, Wineburg said. Educators should be wary of for-profit tools that have not been proven effective based on field studies in real classrooms. Still, McNeill said the current wave of digital literacy legislation is progress to be proud of.

"While we still have a lot to learn, we also know that there are risks for youth online," McNeill said. "We have enough evidence now that there's plenty of reason to take action."

Get the facts

A new book for teens on spotting false information

APA's Magination Press book *True or False? The Science of Perception, Misinformation, and Disinformation* for preteens and young teens explores what psychological science shows about how false perceptions and beliefs are developed and spread. The book also covers how difficult it can be to correct misinformation once it is spreading, how artificial intelligence (AI) and social media can spread incorrect information fast, and why some people twist information on purpose. And it teaches readers ways to debunk misinformation and

think critically and factually about the world. Learn more and order (/pubs/magination/true-false) .

Further reading

What fact-checkers know about media literacy—and students should, too (https://www.edutopia.org/article/what-fact-checkers-know-about-media-literacy-and-students-should-too)
Terada, Y., *Edutopia*, May 26, 2022

Teaching lateral reading: Interventions to help people read like fact checkers (https://doi.org/10.1016/j.copsyc.2023.101737)
McGrew, S., *Current Opinion in Psychology*, 2024

Building media literacy into school curriculums worldwide (https://news-decoder.com/building-media-literacy-into-school-curriculums-worldwide/)
Leedom, M., *News Decoder*, February 29, 2024

Teaching digital well-being: Evidence-based resources to help youth thrive (PDF, 7.8MB) (https://digitalthriving.gse.harvard.edu/wp-content/uploads/2024/03/Center-for-Digital-Thriving-Teaching-Digital-Well-being.pdf)
Weinstein, E., et al., Center for Digital Thriving, 2023

Fighting fake news in the classroom (/monitor/2022/01/career-fake-news)
Pappas, S., *Monitor on Psychology*, January/February 2022

How to use ChatGPT as a learning tool (/monitor/2023/06/chatgpt-learning-tool)
Abramson, A., *Monitor on Psychology*, June 2023

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