

Critical thinking and Media Literacy in an Age of Misinformation
Terry L. Gilmour, Ph.D.

Abstract

Critical thinking is gathering and analyzing information to make a rational judgement. It depends on reasoning to make that decision logically or rationally. To be a acritical thinker, we must understand our own biases, but be open to new ideas and perspectives. We must continue to ask questions and seek additional information and approach decision-making with logic rather than emotions. We must have a healthy skepticism about information and the origin of that information and be able to follow the evidence to a rational conclusion. During the past few decades, the rise in social media has coincided with the spread of misinformation. As political science faculty, perhaps more than faculty in any other discipline, the responsibility of teaching our students how to distinguish between factual and fake information is taking up more of our time in the classroom. This requires teaching more critical thinking skills and incorporating appropriate assignments into our courses to reinforce those skills. This paper will review the literature on the importance of critical thinking and media literacy, the spread of misinformation, tools to be used in the classroom and an attempt to provide pedagogical tools to be used in the classroom developed by students in a small, rural West Texas community college. The bottom line is that we can no longer teach the way we used to – it is imperative that our students take ownership of their own learning experience beginning with their first entry into the college classroom.

Prepared for presentation at the International Political Science Association Meeting,
July 15-19, 2023, Buenos Aires, Argentina

Critical Thinking and Media Literacy in an Age of Misinformation

Introduction:

Students now come to college having grown up with social media, and their abilities to distinguish between fact and fiction in politics is very limited. As professors, especially at the lower levels of teaching political science, we have to spend a considerable amount of time helping students understand the links between critical thinking and analyzing information presented in so many formats. Not surprisingly, the spread of misinformation has coincided with the rise in social media. In a 2022 poll by the Pearson Institute and The Associated Press-NORC Center for Public Affairs Research, several factors emerged: (1) 91% believe the spread of misinformation is a problem, (2) 71% believe they have been exposed to misinformation and of that number 43% believe they have spread misinformation, (3) 73% believe that misinformation increases extreme political views and, (4) 77% believe that misinformation is promotes hate crimes motivated by race, gender, or religion. (Pearson/AP, 2022)

Even our students know that misinformation is a real issue, and they want strategies to deal with the problem. Since they have grown up on social media, they recognize that it is easy to spread misinformation on Instagram, Snapchat or TikTok. Additionally, they know that disinformation, where someone purposefully wants to spread information that is wrong is also prevalent. (Wong, 2023) University of Alberta professor and myth-debunker Timothy Caulfield says, “misinformation is a defining issue of our time. I think it’s good news that more and more people, including governments, are taking this battle against misinformation really seriously, because that’s what’s required. Misinformation is killing people, it’s destroying our democracy. It’s leading to stigma and discrimination.” (Kovtun, 2022) This is not just an American problem. A study by the Council of Europe found similar statistics – 2/3rds of EU citizens say they identify fake news at least once a week. Over 80% say it is an issue for their countries and for democracy in general. And the students/citizens between the ages of 15-30 say they need critical thinking and information skills to help them combat fake news. (Council of Europe, 2018) The Council believes that it is vital that students receive media and information literacy in their curriculum and that the teachers must be trained to help those students critically understand and assess information reported by the media.

Molina, et al (2021) identify seven types of fake news. They refer to false news or hoaxes as information that is not factual and has no basis in reality. Polarized content is using emotion or inflammatory content with individuals falling for the misinformation as the information agrees with their beliefs. Satire is an intentionally false story meant to be perceived as unrealistic, typically used by comedians. Misreporting is related to misinformation or unintentional false reporting from the professional news media. Commentary is different from real news because the journalist is not abiding by the principle of opinion-free reporting. Persuasive information is typically advertisement or promotional told in a narrative form appearing more like a news

article. Finally, the average citizen can now become reporters either through their blogs or websites, or their eye-witness account of breaking news. The authors also point out that two ways of studying fake news have emerged. Some are only interested in the nature of misinformation contained in these false stories, while others concentrate on why people fall for false news.

The Shorenstein Center on Media, Politics and Public Policy at the Harvard University John F. Kennedy School of Government offers a different approach to the problem. They pose the question, given the limited resources, should we concentrate on fighting the spread of misinformation or should we emphasize the acceptance of reliable information? Given that the research has shown that people are approximately as likely to accept a piece of fake news as they are to reject a piece of true news, their study concludes that more effort should be devoted to improving acceptance of reliable information. (Acerbi, et al, 2022)

If there is agreement that propaganda, misinformation and/or fake news is a problem, it will be crucial for schools to provide constant critical thinking in order for the students to be meaningful participants in their communities. Ideally, this would begin in the secondary schools, but there are challenges. First, in all likelihood, students often have more knowledge of the technology than the teachers possess. Finding time for this instruction where the curriculum is already too full is problematic for the public schools. With the speed of how technology is changing, it makes it difficult to keep up-to-date. Since much of this discussion is already taking place in political science classrooms, those of us in the introductory courses will need to build more comprehensive media literacy and critical thinking in our instruction.

The Importance of Critical Thinking:

Critical thinking is the art of analyzing and evaluating thinking with the goal to improve it. It is self-directed, self-disciplined, self-monitored, and self-corrective thinking. (Foundation for Critical Thinking)

The Foundation goes on to say that a well-cultivated critical thinker will:

- Raise vital questions and problems by formulating them clearly and precisely.
- Gather and assess relevant information using abstract ideas to interpret it effectively.
- Come to well-reasoned conclusions and solutions by testing them against relevant criteria and standards.
- Think open-mindedly within alternative systems of thought by recognizing and assessing, as need be, their assumptions, implications, and practical consequences.
- Communicate effectively with others in figuring out solutions to complex problems.

Elder and Paul (2002) believe that asking essential questions is the key to critical thinking. The quality of our lives is determined by the quality of our thinking, and the quality of our thinking is determined by the quality of our questions. For without questions, what would we think about? As the instructors, it means that we have to prepare the questions ahead of time and consider the wording of the questions. We must create a relaxed classroom where students are comfortable answering questions and thinking aloud as they should be encouraged to ask and answer

questions without the fear of criticism for their opinions. In our rush to deliver content, many times we do not take the time for careful deliberation.

We must also prepare our student how to participate effectively. They need to listen carefully to what others say and to take it seriously. They should be looking for reasons and evidence and they should be able to reflect on their assumptions. Students should be looking for examples and analogies and be able to distinguish between what they know and what they believe. They must look beneath the surface and maintain a healthy sense of skepticism. (Boswell, 2006) Proper questioning will engage the students in the learning process. Again, from Elder and Paul, “a mind with no questions is a mind that is not intellectually alive.”

Critical Thinking and Misinformation or Disinformation:

Weiss, et al (2020) suggest that before we can even come up with a definition of fake news, we must consider it from different perspectives. First, it can be the result of information overload. People tend to prefer resources that are the most accessible with fake news will continue to grow if people are unwilling to take the time to look into the facts. Second, people are unable or unwilling to identify fallacies or untruths even in spite of evidence to the contrary. When coupled with the fact that individuals overestimate their knowledge of a subject, these false stories continue to grow. Third, we cannot trust the ones who should be keeping watch on information (internet providers, information management companies) are actually checking for the truth. Fourth, fake news can be propaganda or the intentional distortion of factual information. Finally, fake news becomes rumor arising from ignorance and repeating false information. From these different perspectives, they define fake news in a broader sense, “the phenomenon of information exchange between an actor and acted upon that primarily attempts to invalidate generally-accepted conceptions for truth for the purpose of altering established power structures.” Their solution is for higher education, primarily through the libraries and classrooms, to assist in developing critical thinking skills while acknowledging that there is a lack of consensus on how to teach critical thinking.

The Global Change Program at the University of Michigan has also studied fake news and critical thinking in this post-truth world. They believe it is important because there are professionals who are deliberately trying to fool or mislead us and they usually have a hidden agenda. It is also becoming dangerous to individuals when there is an increasing denial of science. In addition to using critical thinking to debunk fake news, we must use words, arguments, and science. They have developed a quick checklist to detect and debunk fake news – (1) check the sources and who are the authors, (2) read past the headline and determine if there is support for the claim and does it come from a reliable source, (3) try to check our own biases as we have the tendency to process information in a way that confirms our own ideological leanings, (4) try to check our emotions as that clouds our judgment, (5) are other news outlets reporting the same, and (6) go to a fact-check site (Snopes, Factcheck, Politicheck, NewsGuard) to check the authenticity.

Babii (2020) developed a slightly more detailed model of critical thinking to help detect fake news using an individual's self-judgment summarized below:

1. The Emotion – how does it make you feel? If you feel angry to scared, you should not share it.
2. The Conclusion – what idea continues to come to your mind after reading it?
3. The Source – analyze the source of the information to determine if it is trustworthy.
4. The Argument: Identification– what is the conclusion and what were the arguments to support it?
5. The Argument: Evaluation – do those arguments support the conclusion and are they valid?
6. The Context – what is the situation about?
7. The Mental Models – what was your opinion before and did it change?
8. The Polarization – are there just two options to the argument?

Though this requires a little more work than the one from the Global Change Program, it can be utilized in our introductory classes.

Media Literacy and Misinformation or Disinformation:

Once upon a time to be literate, all we needed was to be able to read, write and do some arithmetic. Today, in order to be literate, we must develop many more skills. Digital literacy is an individual's ability to find, evaluate, and communicate information by utilizing typing or digital platforms using both technical and cognitive abilities. Foundational literacy are the skills and strategies involved in reading, speaking, writing, and interpreting our thoughts. Game literacy uses visual media and multimedia to effectively navigate, interact with and achieve goals in a gaming environment. Health and financial literacy is developing the ability to understand and use skills including personal financial management, budgeting, investing and decision-making regarding our healthcare. News literacy is the ability to determine the credibility of news and other information and to recognize the standards of fact-based journalism to know what to trust, share and act on. Visual literacy is a set of abilities that enables an individual to effectively find, interpret, evaluate, use and create images and visual media. Holloman (2021) suggests that we help develop these skills through questioning and to encouraging students to wonder and imagine and ask why. We should also empower our students to make data-informed decision by explaining their decision. She also wants students to incorporate different points of view by asking why different people think they way they do. Finally, students should be encouraged to be creative and go beyond traditional modes of literacy.

Specifically when it comes to media literacy and the news, several suggestions have been recommended. First, the news is never-ending and goes on for 24 hours every day. We need to step back, turn it off, and take a break to think carefully. As with critical thinking, we need to constantly question the credibility of the news source and get our news from a variety of sources. We must think about the purpose of the story – was it to inform us, or to change our mind, or to sell us something? Finally, we need to be aware of the sensational or wild claim and not quickly

rush to share the claim. We should also be talking to our family and our friends about what we are reading or watching. This will challenge our own perspective. We can assist our students by making them find the evidence of the claims being made and to be wary of sensational headlines and images. Even simple things like checking for an unusual URL or there are spelling or grammatical mistakes or incorrect dates or if you cannot find it reported anywhere else are all clues that it may not be factual. (ReachOutAustralia, 2023)

Other strategies to promote media literacy could include encouraging students to create their own media either through podcasts, blogging, or making videos. This is to teach them to be more critical about the sources they are using. They will have to question different sources when creating their own content. We must have open discussion about the media and current events in our classrooms by analyzing content and understanding different points of view. (Newman, 2023)

Strategies for Teaching Critical Thinking:

Through the research, many techniques were found that could be useful in the classroom. PARCS, SIFT, and CRAAP are catchy acronyms for some these different ways to determine if the information presented is indeed useful and factual. PARCS is used to help students think critically using Purpose, Author, Relevance, Currency, and Sources. What is the purpose of the information and does it aim to provide accurate information? Who made the claim and what are their qualifications? Does the claim apply to us specifically? When was the information published? Are the references good and do qualified people hold the same view? (Zucker, 2019) SIFT is a speedy fact-check allowing us to make quick judgments. Do not go down the rabbit hole. Stop and think about the information. Investigate the source. Find better coverage and other sources. Trace the claims to original sources. An example given was a claim by Robert F Kennedy, Jr. alleging a link between the human papillomavirus and cancer. A very quick search revealed that Mr. Kennedy is an anti-vaccine activist and not the best unbiased source on information about a vaccine. (Warzel, 2021)

Finally, there is the CRAAP technique, first developed by librarian Molly Beestrum of Dominican University, with the following acronym:

- Currency – When was it published? Has it been updated?
- Relevance – Does it relate to our needs? Who is the audience?
- Authority – Who is the author and publisher? What are their credentials?
- Accuracy – Is it reliable and truthful? Is it supported by evidence?
- Purpose – Why does this information exist? Is there a bias?

This has been used in the classroom as a 20-minute end of class activity where an article is presented to the class. They discuss in pairs and then share with the entire class. By the end of the semester, they are doing this on their own and by choosing their own source.

Even in 2017, literature for both faculty and students emerged on the need for reliable sources and promoting critical thinking. Students need to understand the consequences of false or bad information and with faculty providing real-life examples, it will make it more real. Faculty

could start with Andrew Wakefield and how his research linking autism and vaccinations was debunked and he was stripped of his medical license. (Rao and Andrade, 2011) We should create assignments where students are charged with finding examples of research fraud. To encourage our students to be skeptical, we must first spend time with them explaining the differences between viable information, misinformation, and disinformation which can be done using the CRAAP test discussed above. When assigning a research paper, make it more about real-life problems and incorporate problem-based learning and scenario-based research to make it more meaningful. With the recent COVID-19 pandemic just barely in our rear-view mirror, perhaps an assignment on rebuilding society after a pandemic to hone those critical thinking skills that will be crucial after their graduation. (Faculty Focus, 2017)

Building on the research of others (Nold, 2017 and Sahamid, 2019), Erdelez, et al (2019) stress the importance of focusing more on qualitative rather than quantitative assessment, asking questions rather than giving easy answers, and training students to be researchers. If we can provide these skills, students will have the ability to determine parts of the whole, interpret cause and effect, and differentiate between credible and false information. The more we expose students to false information, the more unwilling they will be to accept it. This has to happen in the classroom.

Kletter (2020) gives us four skills that we can teach our students to help them combat false information. First, encourage lateral reading or verifying information as it is being read. This might involve leaving the site to check other sites to be sure it is authentic. Second, be critical when looking at images and think about where they were taken. Third, find the origin of pictures. The use of TinEye or Yandex, developed by Google can help with such searches. Finally, use Google Street View to confirm the location of the photograph.

Literary Ideas (2023) provides five strategies to encourage more critical thinking in the classroom:

1. Pro/Pro Chart – Instead of a pro/con list, this approach encourages students to identify the positive aspects of the differing viewpoints. This requires close examination before dismissing ideas that do not immediately fit with our own expectations.
2. Playing Devil’s Advocate – We are familiar with this strategy by having students take the position of the view that they are initially opposed to. I have used this one in the class by assigning students a side to take over building the wall with Mexico. Students are surprised that by doing the research, their initial position changed.
3. The Five Whys – After identifying a problem, ask for five different ways to come to some conclusions.
4. Desert Island Decisions – Most of us are familiar with this one as well. If students are shipwrecked on an island, what are the five items they can salvage, and why were those items chosen.
5. Picture the Scene – When given an image to observe, they must then answer the following questions. What is happening in this image? What lead you to your conclusion?

Jerry Baldasty, Provost of the University of Washington, convened a group of faculty to brainstorm what could be done about combatting disinformation. (2018) From this group came a website full of resources including classroom/workshop activities on confronting fake news and misinformation, fact checkers, and other resources. This can be found at <https://www.washington.edu/strategicplanning/fake-news/>.

On our campus, we have researched and created active-learning classrooms which are configured differently from a traditional classroom. Desks and chairs are easily movable, there are multiple movable whiteboards, and numerous screens linked to the internet. There is no “front of the classroom”, with the atmosphere much more relaxed allowing students to interact with each other easily. Although, this type of classroom is not necessary for active learning, it is a real asset for students. There are many benefits of active learning. Course material is introduced through thinking, writing, talking, and problem solving between the students. There is frequent and immediate feedback which helps the students overcome misconceptions and develop a better understanding of the material. By working on activities, they develop relationships with their peers and their instructor. This interaction also helps to create a sense of community in the classroom. It also allows the instructor to observe the students gain insight on how they learn best. In my classrooms, we have focused many of our activities on media literacy and critical thinking. The lack of information and acceptance of fake news is alarming.

In my position at Midland College, I also serve as the Director of the Honors Program and as Advisor for our chapter of Phi Theta Kappa (PTK), the International Honor Society for Community College Students. One of the major requirements for PTK is to implement a College Project which directly supports the mission of the college. Four of the students and I began meeting during the summer of 2022 to decide on our project. I told them about a presentation that I saw at the Southwestern Political Science Association where a couple of political scientists and a philosopher from Georgia State University presented a paper on critical thinking during these times of misinformation. The three of them had created an interdisciplinary module to address the intersection of critical thinking, misinformation, democracy, and higher education. Using this work as a starting point, the students decided to put together learning modules that would address critical thinking and media literacy. The General Education Curriculum Committee at Midland College was already in discussion about media literacy, so they gave their support to the project in addition to our college president, the vice president of instruction, the Teaching & Learning Center, and the department chair of Student Success. At that point, the students began researching and ultimately decided on eight learning modules that were created in Articulate 360 Rise. They are now part of every faculty member’s Canvas account and can be easily dropped into their courses where they can choose a module separately or as a complete module containing all eight. The modules were tested during the fall of 2022 in all of my government classes and in five of the Effective Learning classes. The students made a presentation at the January Faculty Convocation to demonstrate the modules which allowed faculty to ask questions and offer feedback. Beginning in the spring semester of 2023, the modules were incorporated into all of the Effective Learning classes which are required for all students at Midland College. During the spring of 2023, we added one additional module on Artificial Intelligence.

The learning modules are entitled “Learning to Think for Yourself: In An Age of Misinformation” and the nine sub-modules are:

1. What is Critical Thinking?
2. The Critical thinking Process
3. Understanding Cognitive bias
4. Fallacies and Bias
5. How to Identify Reliable Information
6. How to Identify Satire and Fake News
7. The Rise of Social Media and the Dangers
8. Conspiracy Theories
9. Artificial Intelligence

Feedback from the spring classes has been very positive. In my classes, we had great discussions on the modules after the students had completed them. They found them engaging and informative, learning things they did not previously know. When I told them that my students had created them, they were not surprised because they were fun so I could not have been the author! I had them complete all of the original eight modules for a participation grade, and it worked seamlessly in Canvas.

The most exciting thing about this project is that it was created by students for students. This fits in so well with the literature on active learning discussed above. They did all the research and chose activities they believed would be interesting to other students. Their work was so well received by faculty and administration. We are enthusiastic about the conversations these modules can foster in the classroom. We believe faculty from all disciplines can benefit from one or more of the modules. Because these topics are integral to our discipline of political science, all the faculty in my department are using all eight modules. Some faculty are beginning their classes with the critical thinking modules and then dropping in the others as they cover different topics. After a presentation at the Teaching and Learning Conference sponsored by the American Political Science Association in Baltimore in 2023, APSA Educate intends to have these learning module resources available to all political scientists by the end of summer 2023.

Conclusion:

An increasing number of faculty are spending more time in the classroom teaching critical thinking and media literacy. We want our students to have the knowledge, skills, attitudes, and values to be successful in the world today. We as educators are trying to determine the best ways to deliver and strengthen these skills. We want them to think about a problem or a particular argument and give more thought to it a little longer. Rather than rushing to judgment, we must convince them to take the time to develop a solution and a conclusion based on facts. We want them to consider alternatives to overcome their own biases and leave personal emotions at the door when analyzing the information to determine if it is factual or false.

Citations

- Acerbo, Alberto, et al., (2022). “Research note: Fighting misinformation or fighting for information?” *Harvard Kennedy School (HKS) Misinformation Review*, 3(1).
<https://misinforeview.hks.harvard.edu/article/research-note-fighting-misinformation-or-fighting-for-information/>
- “Active Learning” (2023). Center for Teaching Innovation. Cornell University.
<https://teaching.cornell.edu/teaching-resources/active-collaborative-learning/active-learning>
- Anderson, Allison. (2023). “Knowledge and Skills for Becoming Global Citizens.” Brookings.
[https://www.oecd.org/education/2030/E2030%20Position%20Paper%20\(05.04.2018\).pdf](https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf)
- Baldasty, Jerry. (2018). “Fake news and misinformation: Why teaching critical thinking is crucial for democracy.” University of Washington.
<https://www.google.com/search?client=safari&rls=en&q=fake+news+and+misinformation%3A++why+teaching+critical+thinking+is+crucial+for+democracy&ie=UTF-8&oe=UTF-8>
- Boswell, Carol. (2006). “The Arti of Questioning: Improving Critical Thinking.” *Annual Review of Nursing Education*. NY. Vol.4.
- “Break the Fake: Critical thinking vs. disinformation.” (2022). *Media Smarts*.
<https://mediasmarts.ca/teacher-resources/break-fake-critical-thinking-vs-disinformation>
- Cuza, Alexandra. (2020). “The Use of Critical Thinking Against Fake News.” *US Department of Education*. <https://files.eric.ed.gov/fulltext/ED616249.pdf>
- “Dealing with Propaganda, misinformation and fake news.” (2023). *Council of Europe*.
<https://www.coe.int/en/web/campaign-free-to-speak-safe-to-learn/dealing-with-propaganda-misinformation-and-fake-news>
- Dwyer, Christopher (2017). “5 Tips for Critical Thinking.” *Psychology Today*.
<https://www.psychologytoday.com/us/blog/thoughts-thinking/201711/5-tips-critical-thinking>
- Elder, L., & Paul, R. (2002). “The Miniature Guide to the Art of Asking Essential Questions.” Santa Rosa, CA: *Foundation for Critical Thinking*.
- Erdelez, Sanda, Agarwal, Naresh Kumar, Jahnke, Isa. (2019). “Serendipity and critical thinking: Fighting disinformation in a socio-technical society.”
<http://web.simmons.edu/~agarwal/files/Erdelez-Agarwal-Jahnke-2019-ASIS&T-SISymposium.pdf>

“Fake news and critical thinking in the post-truth world.” (2022). *Global Exchange – University of Michigan*.

https://globalchange.umich.edu/globalchange1/current/lectures/klings/fake_news/fake_news.html

“5 Ways to Improve Student Critical Thinking Skills in the Era of Fake News.” (2023).

Literacy Ideas. <https://literacyideas.com/5-ways-to-improve-critical-thinking-skills/>

Freelon, Deen, et al., (2021). “Critical Thinking Bootcamp 2021.” Sage Publications.

<https://static1.squarespace.com/static/5d5ad9e0100bdf0001af0f5e/t/612f7f912d379b46522170f8/1630502802587/2021+Critical+Thinking+Bootcamp+Toolkit.pdf>

Gaultney, Ira, et al., (2022). “Political Polarization, Misinformation, and Media Literacy.”

Journal of Media Literacy Education.

[https://www.oecd.org/education/2030/E2030%20Position%20Paper%20\(05.04.2018\).pdf](https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf)

Holloman, Sherrish. (2021). “Combatting Misinformation with Critical Thinking.”

Center for the Professional Education of Teachers. <https://cpet.tc.columbia.edu/news-press/information-overload-combating-misinformation-with-critical-thinking>

Jones, Katherine (2017). “Reliable Sources: Promoting Critical Thinking in the [Mis]information Age.” *Higher ED Teaching Strategies*. Magna Publications.

<https://www.facultyfocus.com/articles/teaching-and-learning/promoting-critical-thinking-misinformation-age/>

Klepper, David. (2022). “Poll: Most in U.S. say misinformation spurs extremism, hate.”

AP News. October 12, 2022. <https://apnews.com/article/religion-crime-social-media-race-and-ethnicity-05889f1f4076709c47fc9a18dbec818a>

Kletter, Melanie. (2020). “The Importance of Critical Thinking in the Age of Fake News.”

School Library Journal. <https://www.slj.com/story/the-importance-of-critical-thinking-in-age-of-fake-news-webcast>

Kovtun, Dennis. (2022). “Misinformation is killing people: A Q&A with misinformation expert Timothy Caulfield.” *CBS News Canada*.

<https://www.cbc.ca/news/canada/edmonton/misinformation-is-killing-people-a-q-a-with-misinformation-expert-timothy-caulfield-1.6700533>

“Many Believe Misinformation is Increasing Extreme Political Views and Behaviors.” (2022). *Pearson Institute and the Associated Press-NORC Center for Public Affairs*.

<https://apnorc.org/projects/many-believe-misinformation-is-increasing-extreme-political-views-and-behaviors/>

Meeks, Jennifer Lobo, et al., (2022). “Critical Thinking in the Age of Misinformation.” Paper presented at the annual meeting of the Southwestern Political Science Association. San Antonio, Texas. April 2022.

Molina, M.D., et al., (2021). “Fake News Is Not Simply False Information: A Concept Explication and Taxonomy of Online Content.” *American Behavioral Scientist*, 65(2), 180-212. <https://pennstate.pure.elsevier.com/en/publications/fake-news-is-not-simply-false-information-a-concept-explication-a>

Newman, Jeremy. (2023). “Teaching Students Critical Thinking and Media Literacy for Combat Fake News.” *Scioto Post*. <https://www.sciotopost.com/teaching-students-critical-thinking-and-media-literacy-for-combat-fake-news/>

Nolan, Susan. (2017). “Critical thinking and information fluency: Fake news in the classroom.” *American Psychological Association*. <https://www.apa.org/ed/precollege/ptn/2017/05/fake-news>

Nold, H. (2017). “Using Critical Thinking Teaching Methods to Increase Student Success: An Action Research Project.” *International Journal of Teaching and Learning in Higher Education*. 29(1), 17-32.

Puig, Blanca, et al., (2021). “Fake News or Real Science? Critical Thinking to Assess Information on COVID-19.” *Frontiers in Education*, Volume 6.

Rao, T.S. Sathyanarayana and Chittaranjan Andrade. (2011). “The MMR vaccine and autism: Sensation, refutation, retraction, and fraud.” *Indian Journal of Psychiatry*. 53(2), 95-96

“Reliable Sources: Promoting Critical Thinking in the [Mis]information Age.” (2017). *Faculty Focus*. <https://www.facultyfocus.com/articles/teaching-and-learning/promoting-critical-thinking-misinformation-age/>

Sahamid, H. (2014). “Fostering critical thinking in the classroom.” *Advances in Language and Literacy Studies*, 5(6), 166-172.

“The Future of Education and Skills: Education 2030.” (2018). *Organisation for Economic Co-operation and Development (OECD)*. [https://www.oecd.org/education/2030/E2030%20Position%20Paper%20\(05.04.2018\).pdf](https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf)

“The news and critical thinking: Why is it important?” (2023). *Reach Out*. <https://au.reachout.com/articles/the-news-and-critical-thinking-why-is-it-important>

Warzel, Charlie. (2021). “Don’t Go Down the Rabbit Hole.” *New York Times*. <https://www.nytimes.com/2021/02/18/opinion/fake-news-media-attention.html>

Weiss, Andrew. (2020). “Surveying fake news: Assessing university faculty’s fragmented definition of fake news and its impact on teaching critical thinking.” *International Journal for Educational Integrity*. <https://edintegrity.biomedcentral.com/articles/10.1007/s40979-019-0049-x>

Wong, Jessica. (2023). “Students know misinformation abounds online. Experts say critical thinking helps them navigate it.” *CBS News Canada*.
<https://www.cbc.ca/news/canada/education-mis-disinformation-1.6836531>

Zucker, Andrew. (2023). “Using critical thinking to counter misinformation.” *National Science Teachers Association*. <https://www.nsta.org/using-critical-thinking-counter-misinformation>