

Civic Reasoning and Discourse Across The Curriculum

DIGITAL CITIZENSHIP EDUCATION



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WHAT IS DIGITAL CITIZENSHIP EDUCATION?

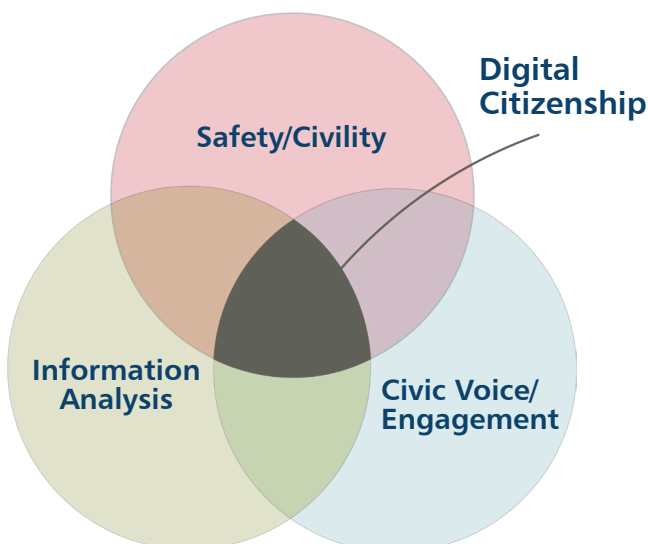
Defining Digital Citizenship Education

Digital citizenship education develops the knowledge, skills, and dispositions that students need to navigate an ever more complex digital environment safely and responsibly. Such training not only fosters students' media literacy skills to analyze and engage with digital content but also prepares them to develop an understanding of the structural factors that influence public thinking and discourse in digital spaces. Through digital citizenship education, students are empowered to become agentic consumers and creators of digital content, and they are equipped with the capacities necessary to identify and respond to harmful content as well as the algorithmic and structural factors that support its creation.

INTRODUCTION

We live in a digital age. Our engagement in civic and political life and our engagement with digital media are deeply intertwined—presenting a vast array of new opportunities and challenges related to civic reasoning and discourse. This transformation, appropriately, has led to calls for an educational response. In particular, reform efforts in digital citizenship education cluster around three priorities: (a) promoting civility and diminishing bullying, (b) supporting credibility assessments of online information, and (c) promoting civic voice (see Figure 1).

Figure 1: Typology of Priorities for Current Digital Civics Education



We believe these three priorities are worthy of the attention they have received. Evidence indicates that educational efforts can be impactful, especially in helping to diminish cyberbullying and to increase students' capacities to decide what online sources to trust (Gaffney et al., 2019; Wineburg et al., 2022). At the same time, we must expand our understanding of these three priorities if we wish to promote the complete range of civic capacities. Indeed, if our schools were to provide civic education that truly prepares young people to contend with factors such as political polarization, disinformation, racism, and other forms of prejudice that make civic reasoning and discourse so challenging, then these efforts will need to expand significantly.

In what follows, we discuss ways that educators can expand attention to these three priorities for innovative instructional design. All three can support effective teaching and learning for the entire K–12 grade bands and across all subject areas.

The examples we provide throughout this report focus, in particular, on the challenges posed by race and racism in the U.S. context. We chose to highlight this fundamentally important, longstanding, and continuing challenge because confronting it is essential if we are to educate toward democracy. Online dynamics exploiting racism, often intertwined with factors such as strong partisan divides and use of disinformation, present some of the most vexing and

important problems for those seeking to educate for digital citizenship. In saying this, we do not mean to discount the significance of other challenges—deeply problematic dynamics often also surface in exchanges related to gender, sexual orientation, religion, and immigration. And challenges tied to these and other issues intersect—they often cannot be adequately addressed independently. Thus, while the discussion in the front half of this report centers on concerns regarding race and racism, the examples detailed at the end include a broader array of issues. To be sure, the strategies and priorities for reform we outline are just initial steps, but we believe they can help educators at all levels chart a path through the storm that both youth and adults currently confront.¹



Expanded Priority 1: Delve Deeper Than Surface-Level Civility

A popular digital citizenship curriculum from Common Sense Media used in more than 75,000 schools includes the story of Marcus, an eighth grader who creates a pseudonymous Instagram account and posts an image of his rival school's mostly Black basketball team along with a racist message. When other students from Marcus's school find the post, they post their own racist jokes. The eighth-grade lesson plan suggests that teachers use this hypothetical example to start a discussion with students about ways they can respond to cyberbullying and online hate speech, focusing on raising awareness and supporting those targeted by discrimination and bigotry.

This lesson plan is emblematic of many current instructional resources in this area in that it engages on a surface level with the volatile combination of social media, racism, and civic discourse but fails to delve deeper into the root causes of racism and racist rhetoric in U.S. society. As important as it is to teach values of kindness and civility in the face of online racism, lessons that focus on these values often dodge much thornier questions lurking just below the surface. For example, how do the structures of online environments facilitate racism? What does the prevalence of racism online suggest about the state of our society? Other than promoting civility, what can be done to address this urgent social challenge? While this scenario is certainly a valuable conversation starter and could help students consider how they can respond when they see racist posts, it does not do enough to prepare students for the complex demands of digital citizenship. Such preparation requires fuller consideration of the root causes and mechanisms of polarization (and its frequent White supremacist undertones). So, how can teachers get to these deeper issues?

¹ This report on education and digital citizenship draws on our work as members of the Educating for Civic Reasoning and Discourse Commission (sponsored by the National Academy of Education; see Lee et al., 2021) in which we reviewed the existing research on digital citizenship, focusing specifically on educators' efforts to help students use digital tools for civic and political engagement (see Garcia et al., 2021). It also draws significantly on an article (Mirra et al., 2022) we recently published on this work in *Phi Delta Kappan*. This brief has a slightly different focus than those two documents, however. Our aim is to provide a brief review of our findings from our larger research project and to point educators toward resources and frameworks that can help them respond to the sizable challenges and opportunities created by the digital revolution.

One strategy involves supplementing vignettes like this one with data points that speak to broader structural trends. For example, the story about Marcus could be paired with the recent finding that the average Black adolescent receives two derogatory messages online each day, such as a racist image or a racist joke (English et al., 2020). Now, conversation about an individual incident can be put into a wider social context and spark provocative questions such as the following: If a post like this occurred at our school, what should happen to the student who posted it? Other than addressing this single event, are there things teachers, the principal, or students could do to prevent such abuse? Students might also think about online environments more generally: Do platforms like Instagram do all they can to stop these kinds of events? Are there things they could do that would help? Finally, it would be valuable for students to consider broader societal dynamics—for example, how is it that the same racist practices keep being recycled by different kids and adults year after year?²

In short, in order to address the kind of challenge detailed in the example above, dialogue must dig into what it means to be a citizen committed to challenging systemic racism in our democracy. Data points can be drawn from local or national research and policy documents and even become a catalyst for classroom inquiry for students who seek additional data to inform class discussions. While the challenges of racism defy simple solutions, encouraging students to think more carefully about why racist messages proliferate on digital platforms is an important step to addressing the problem. The guidance simply to “be nice” online, without further analysis of the issue, rings hollow as the storm rages.

Expanded Priority 2: Focus on Credibility and Underlying Motivations

On August 23, 2020, the eve of the Republican National Convention, the Twitter (now branded as X) account @WentDemtoRep tweeted, “I’ve been a Democrat my whole life. I joined the BLM protests months ago when they began. They opened my eyes wide! I didn’t realize I became a Marxist. It happened w/o me even knowing it. I’m done with this trash. I’ll be registering Republican.” This tweet quickly accumulated 39,000 likes and 22,000 retweets before Twitter suspended the account for violating its policies on platform manipulation. It turns out that the same tweet was posted by dozens of other accounts as part of a targeted disinformation campaign (Timberg & Stanley-Becker, 2020). As this example demonstrates, online platforms are frequently used by actors with a wide range of purposes and intentions—from positive to malicious—to persuade and manipulate users. To realize the benefits of this mechanism for dialogue, persuasion, and learning and to minimize the costs, it is vital that all users become both more aware of the ways that manipulation in the digital environment is used as a tool for persuasion and mobilization and better able to navigate an environment with large amounts of misinformation and disinformation.

In today’s digital landscape, teachers need to push beyond source and evidence evaluation. Students should learn to analyze the contexts, technological systems, power and economic relations, and motivations that underlie the production and fuel the spread of online content. Much digital information is produced by actors or organizations with explicitly partisan or ideological goals. In this environment, students should not only understand who produced information but also consider why it was produced and who stands to gain power or influence from its spread.

² Relatedly, one of the most common and deeply harmful uses of artificial intelligence relates to fake sexualized depictions of specific women and girls. Individuals often engage in these acts, and those individual actions require a response. In addition, however, this repeating phenomenon, like those related to racist tropes, speaks to a broader pattern that also needs attention.

When students browse and search online platforms, they need to adopt a critical stance toward information that is based in knowledge of the range of actors, sources, and messages they are likely to encounter. This includes knowing that both human and non-human actors, in the form of automated technological programs like generative artificial intelligence (AI), produce digital content. Students should understand how online systems are structured, learn to evaluate online information critically, and practice locating credible sources. Students should prioritize investigating the source, asking questions like the following: Who produced this post? Are they an authoritative, trustworthy source on this topic? What might their motivations for producing this content be? Asking these questions of any online information—including generative AI outputs—will help students locate credible sources. At the same time, students should learn not to judge online content based on features they may be tempted to rely on, including its appearance, URL, or the volume of evidence it purports to provide. Efforts to teach students to evaluate online information can help them improve at finding high-quality sources and evidence.

EXPANDED PRIORITY 2

Teacher Resources

Examples of two freely available teacher resources, both backed by research showing that students' evaluations improve after completing lessons from the curriculum:

- [Civic Online Reasoning](https://cor.inquirygroup.org/)³ curriculum
- CIVIX's [Ctrl-F lessons](https://ctrl-f.ca/en/)⁴

Teachers could help students understand that the production and spread of digital disinformation is often performed for political or ideological gain. Such information often uses racist tropes or messages to inflame preexisting tensions and biases and to promote White supremacy. Consider, for example, the Russian disinformation campaign during the 2016 presidential election cycle. It has been reported widely that Russian operatives tried to use social media to weaken confidence in our democratic institutions. What has received far less attention from the news media, however, is the extent to which their strategy focused on race. Sixty-six percent of Russia-sponsored Facebook posts, for example, aimed to stoke racial division on both the political right and left either by promoting hate among White supremacist groups or by heightening distrust in Black communities (U.S. Senate Select Committee on Intelligence, 2020). If teachers support students to consider the political motives that often influence the creation and dissemination of social media posts, young people can learn to look beyond individual sources, ask how sources are connected, and investigate why disinformation is produced and shared.

In addition to helping students evaluate the political purposes of disinformation, teachers can ask them to consider their own motivations for sharing such material and related potential biases they may have that could distort both the content they produce and share and the way they judge posts by others. Indeed, even if students know how to evaluate information, they may still post and share misinformation that aligns with their political views or ideological positions. This is due both to the fact that youth and adults are less likely to evaluate content critically that aligns with their perspectives and because some individuals knowingly share false information. Students won't necessarily stop retweeting false information just because their teachers call them on it, but at the very least, they should be challenged to reflect on such behavior and define their ethical position on it.

Finally, young people should not only learn to evaluate the credibility of online information but also be challenged to decide how and whether to act on what they have learned. For example, they can

³ <https://cor.inquirygroup.org/>

⁴ <https://ctrl-f.ca/en/>

consider how they might take action in response to online mis- or disinformation in ways that promote equity and justice.

Expanded Priority 3: Support Youth Civic Voice

"The world needed to see what I was seeing," said 17-year-old Darnella Frazier, explaining why she took out her phone to record the murder of George Floyd on May 25, 2020 (Sullivan, 2021). The video galvanized an international protest of state-sanctioned violence, even murder, against Black Americans. Driven by a sense of civic responsibility, Frazier bore witness using the digital tool available at her fingertips, and her action shows the power of youth civic voice.

Whereas young people traditionally may have been guided toward forms of civic participation that required them to be of voting age and legally recognized as U.S. citizens, today's digital tools broaden the ways young people can engage with complex civic issues. Rather than serving to keep minors on the sidelines, public platforms like Twitter and

Facebook have illuminated how youth advocacy can make substantial real-world change. From a youth-organized global climate strike to legions of K-pop fans crippling a presidential rally for Donald Trump, contemporary examples of youth organizing and participating in online spaces are abundant. The opportunities for developing and honing youth civic voice in classrooms can also be developed in spaces cordoned off specifically for education.

These kinds of educational resources can help students learn (alongside their teachers) how to use their voices in ways that resonate in public contexts outside of school. That is, digital tools can create opportunities for civic involvement that recognize and demonstrate the legitimacy and civic brilliance of young people's ideas, whether they are blogging, sharing thoughts on a class-managed X (formerly branded as Twitter) account (that allows them to preserve their anonymity), or creating digital public service announcements or infographics that can be shared on school social networks and beyond (see examples and materials for [making infographics](#)⁸, [photo journalism](#)⁹, and [blogging](#)¹⁰). Teachers across subject areas and age groups can cultivate youth civic voice in the present moment, not simply prepare them for the future.

EXPANDED PRIORITY 3

Teacher Resources

- [KQED's Learn platform](#)⁵ and [Youth Voices](#)⁶, for example, are spaces where teachers can invite middle and high school students to create content, view content created by other students, and participate in discussions about current issues.
- Facing History's [10 Questions for Young Changemakers](#)⁷, developed with the Democratic Knowledge Project, provides a unit that helps students learn how to leverage the power of digital media to work effectively and safely toward the changes they hope to bring about.

INTEGRATING DIGITAL CITIZENSHIP EDUCATION INTO THE DISCIPLINES

The three priorities noted above highlight ways that teachers can expand lessons on civility, information analysis, and civic voice to give greater attention to the ways in which cultural, political, and institutional factors influence what students encounter online. Table 1 (Page 6) summarizes how the current digital citizenship curricula could be expanded. In particular, it highlights the need for students to take a deeper look at how the digital world works, including how and why racism, sexism, homophobia, and other prejudices remain so prevalent online; why so much online content reflects partisan biases; and why so much of that content aims to promote distrust of and disrespect for others.

⁵ <https://youthmedia.kqed.org/>

⁶ <https://www.youthvoices.live/>

⁷ <https://www.facinghistory.org/resource-library/10-questions-young-changemakers>

⁸ <https://www.ed4democracy.org/videos/infographics-for-change>

⁹ https://vimeo.com/407481983?embedded=true&source=video_title&owner=21729619

¹⁰ <https://www.ed4democracy.org/videos/blogging-youth-civic-voice>

Table 1 Priorities of Expanded Digital Citizenship

	Digital Citizenship	Expanded Digital Citizenship
Safety/ Civility	<ul style="list-style-type: none"> • Properties of whole numbers and fractions • Be an “upstander” rather than a “bystander” when encountering disrespectful or discriminatory posts on social media by supporting victims and chastising perpetrators 	<ul style="list-style-type: none"> • Learn about how racist scripts and other scripts that marginalize varied groups have become embedded in cultures • Learn to identify and call out racist, sexist, homophobic, and other tropes • Consider and counteract the cumulative impact of racist messages on people of color in civic life • Reach beyond assumptions of kindness and work toward restorative talk-oriented racial justice
Information Analysis	<ul style="list-style-type: none"> • Learn to analyze online information effectively • Find high-quality sources to inform decisions • Do not share information from questionable sources 	<ul style="list-style-type: none"> • Explore how and why disinformation is promoted by political organizations and other groups • Analyze why so much mis- and disinformation focuses on race and other divisive issues • Reflect on how your beliefs influence how you evaluate and share information • Examine ways that clickbait and other techniques are used in combination with algorithms to exploit and expand political and social divisions for profit and political purposes
Civic Voices	<ul style="list-style-type: none"> • Build from youth interest and sentiment • Expand on students’ nuanced online skills for communicating and dialoguing with peers 	<ul style="list-style-type: none"> • Examine ways that platforms structure online voice and discourse • Consider the relationship between individual voices online and the ways they reach audiences or influence others • Explore the influence of algorithms on racism and bias

Of course, few schools and districts will provide instruction tied to digital citizenship as a standalone course. Rather, these educational priorities must be integrated across the curriculum and incorporated into standards for varied disciplines. For this to occur, educators at every level must receive sustained training about how to engage in conversations about systemic inequality, race, and racism with young people in ways that do not create further harm. Moreover, educators will need time and support if they are to draw on and organize such resources both to advance these expanded priorities for digital citizenship education and to integrate these needs into their courses.

To be sure, school and district leaders—and the broader education community—must make greater investments in this work, and they must provide firm support for the teaching of digital citizenship in the face of efforts now underway in many states to curtail discussions of challenging topics (related to race in particular) in schools. If schools are to provide foundational support for a democratic society, both this work and the supports needed to enable it are vitally important.

Teacher Resources

It is encouraging to see that many curricular organizations are working to create model units and share resources related to digital citizenship:

- The National Association for Media Literacy Education’s [Core Principles](#)¹¹ articulate its position on media literacy education and illuminate the complex dynamics between individuals, media, and the systems and structures that shape our world. The additional Implications for Practice, which are available to view under each principle, highlight distinguishing features of effective media literacy education.
- The National Council of Teachers of English has developed reports, policy briefs, and webinars focused on critical media literacy that can be leveraged for planning at the district and classroom level (see <https://ncte.org/critical-media-literacy>).
- The National Council for the Social Studies has issued a position statement tied to a valuable collection of resources focused on [Media Literacy](#)¹² as well as a statement on [Youth, Social Media, and Digital Civic Engagement](#)¹³.
- Several school districts are now compiling [teaching resources](#)¹⁴ in these areas.

¹¹ <https://namle.org/resources/core-principles/>

¹² <https://www.socialstudies.org/position-statements/media-literacy>

¹³ <https://www.socialstudies.org/position-statements/youth-social-media-and-digital-civic-engagement>

¹⁴ <https://infohub.nyced.org/in-our-schools/programs/digital-citizenship>

There are numerous ways to promote media literacy and digital citizenship. Below, we describe and provide links to three lessons as well as some related materials. These lessons situate the development of digital citizenship in analysis of the media ecosystem in a manner consistent with this report. These lessons also attend to factors such as political polarization, prejudice, and varied political and economic interests—factors that make high-quality civic reasoning and discourse both so challenging and so important.

LESSON 1: LEARNING FOR JUSTICE

[Learning for Justice's](#)¹⁵ lesson [Media Consumers and Creators, What Are Your Rights and Responsibilities?](#)¹⁶ is designed for middle and high school students.¹⁷ The lesson provides details including Objectives, Essential Questions, Materials, Vocabulary, the Procedure (or flow of activities), Alignment with Common Core State Standards, and links to relevant supporting materials. During the lesson, in addition to learning about ways to examine the credibility of digital content, students examine PEN America's News Consumers' Bill of Rights and Responsibilities and consider both the responsibilities of news consumers and of news creators. Students are also prompted to consider questions such as "Who benefits from a particular argument?" and to reflect on the ways a given media strategy may seek to influence readers' emotions or play to their biases.

Connecting Digital Citizenship Education Lesson to Civic Reasoning and Discourse.

Knowledge.

The lessons on rights and responsibilities for middle and high school students are designed to expand students' knowledge of the operation of news media or their knowledge of ways to assess the credibility of online content. This content ranges from clarifying or learning the meaning of key vocabulary

(i.e., "consumer" or "rights") to learning strategies for judging the factual accuracy of claims they find in online posts. The lessons also surface ways that manipulative strategies are sometimes employed to influence consumers of digital content. By highlighting PEN America's News Consumers' Bill of Rights and Responsibilities, the lessons also promote knowledge of the role standards can play in improving the quality of online content.

Epistemology.

In addition, these lessons surface multiple questions tied to epistemology as they encourage students to acknowledge complexity and resist simplistic solutions. Some forms of "fake news" are clear, for example, but many claims and perspectives might be regarded as manipulative and false by some and the result of heartfelt commitment and passion by others.

Ethics.

Ethical questions surface as well when considering, for example, the *News Consumers' Bill of Rights and Responsibilities*. What is the correct balance of individuals' and groups' rights and responsibilities, for example, when it comes to the production, circulation, and consumption of digital content?

Dispositions.

Relatedly, lessons on producing digital information for upper-elementary school students can help foster dispositions as an author or content creator and can help students practice using their voice and sharing their perspectives and thoughts. Regardless of age, as students encounter age-appropriate controversial and complex new content, countless valuable dispositions can be developed including a commitment to avoiding use of falsehoods when making one's arguments and to interacting in ways that model respect, concern for others, and a commitment to justice.

¹⁵ <https://www.learningforjustice.org/>

¹⁶ <https://www.learningforjustice.org/classroom-resources/lessons/media-consumers-and-creators-what-are-your-rights-and-responsibilities>

¹⁷ Learning for Justice provides related lessons for all grade levels. For example, elementary-level students can address issues of civic voice and engagement through a lesson on [Producing Digital Information](#).

LESSON 2: PROJECT LOOK SHARP

[Project Look Sharp's](#)¹⁸ lesson on [Covering Black Lives Matter: Front Page Constructions](#)¹⁹ provides an additional illustration of a lesson for middle and high school students that develops skills linked to information analysis and consideration of media messages.

Connecting Digital Citizenship Education Lesson to Civic Reasoning and Discourse.

Knowledge.

Students develop knowledge, for example, of issues and events such as the murder of George Floyd and the protests that followed. They will also gain knowledge of essential media concepts such as “point of view” and related strategies for media analyses. For example, students are asked to look for patterns in the coverage and to identify ways that the messages of varied newspaper headlines differed—and they are asked to assess the significance of such differences. Students are also asked to assess and explain why they view the coverage as an editorial opinion, as factual news, or as a combination of both. And students are asked to consider whether they think their own biases influence their analyses of these media messages as well as who might benefit from and who might be harmed by these images/messages.

Epistemology and Ethics.

A strength of this lesson's approach is its focus on media decoding—an analytic process through which students develop habits of inquiry and reflection that is consistent with our report. Its [Categories and Sample Questions for Media Decoding](#)²⁰ focuses attention on key epistemological and ethical questions, including the following: “Who made this (media) and for what purposes?” “What values, ideas, and biases are overt or implied?” “Whose voices are included and whose are left out?” “How do my experiences and identity (race, gender, religion, etc.) impact my interpretation?” These processes also enable consideration of a wide range of ethical issues relating both to choices made by authors of these pieces and, of course, to questions the students may ask themselves regarding the ethical decisions of those involved in these events.

Dispositions.

In addition, as students consider their own reactions and possible actions in relation to the issues being discussed, opportunities exist to promote and consider both ethical questions and dispositions related to the ways they engage (or do not) with various media and the ways they discuss complex and controversial issues with others in the classroom with whom they may not agree. Finally, a wide range of developmental issues may surface as students reflect on their own biases and personal responsibilities and look for ways to enact agency tied to the issues and values they have identified.

More on Project Look Sharp

In addition, Project Look Sharp provides lessons on related topics for all grade levels, and its focus is on media generally—not only online forms of engagement. For example, it has lessons on media that attend to diversity, biases, and racism that focus on social studies and English language arts topics such as [Asian People in the Media](#)²¹ for middle school, high school, and college students. Project Look Sharp also provides lessons for elementary school students such as [Gender in Children's Commercials: Magic Kissing Dragons](#)²² which is part of a collection on [Critical Thinking & Health: Nutrition and TV Commercials](#)²³. These lessons, like those described in more detail above, provide opportunities for students to develop knowledge and skills related to media analysis as well as dispositions such as being a critical consumer of media advertising. In addition, these lessons highlight vital ethical questions regarding the activities of various businesses and institutions as well as ways that young people should respond to what they are learning.

¹⁸ <https://projectlooksharp.org/>

¹⁹ https://www.projectlooksharp.org/front_end_resource.php?resource_id=526

²⁰ <https://projectlooksharp.org/Resources%2020/Key-Questions-for-Decoding%20Dec-21.pdf>

²¹ https://projectlooksharp.org/front_end_resource.php?resource_id=560

²² https://media.ithaca.edu/media/Gender+in+Children%27s+CommercialsA+Magic+Kissing+Dragons/1_uqhnosbu

²³ https://projectlooksharp.org/front_end_resource.php?kit_id=15

LESSON 3: STANFORD'S CLASSROOM-READY RESOURCES ABOUT AI FOR TEACHING

A lesson plan from Stanford's Classroom-Ready Resources About AI for Teaching (CRAFT) initiative focuses on [how algorithmic bias impacts different AI applications](https://craft.stanford.edu/resource/how-does-algorithmic-bias-impact-different-ai-applications/).²⁴ The lesson, which is intended to help students "explain how algorithmic bias is present in various AI applications" and "explain the consequences of bias in algorithms," includes a central question; key vocabulary; a lesson plan for teachers; and all lesson materials, including lesson slides, reading materials for students, and a scaffold to support students' small group discussions. Over the course of the lesson, the teacher supports students to review and summarize what algorithmic bias is (the subject of another CRAFT lesson) and then investigate different applications where algorithmic biases might be present. Working in groups, students read articles and explore an online simulation focused on biases including racism, sexism, antisemitism, and xenophobia present in Chat-GPT outputs, medical diagnostic tools, and facial recognition systems. As students read, they discuss consequences of algorithmic biases described in the articles and draw connections across them. The lesson ends with an optional seminar in which students discuss questions including the following: "Is it possible to create unbiased algorithms using data from a world with diverse cultures and values?" "Different people in different fields define 'fairness' differently. How would you define 'fairness' in an AI algorithm?"

Connecting Digital Citizenship Education Lesson to Civic Reasoning and Discourse.

Knowledge.

Over the course of the Digital Citizenship Education lesson, students build knowledge of the contexts and structures that produce online content by analyzing what algorithmic bias is and how it may affect different AI-related applications. Furthermore, students analyze underlying similarities and differences in examples of algorithmic bias in various areas and wrestle with the complex question of how best to respond to this complex societal problem.

Ethics.

The discussion questions toward the end of the lesson prompt students to consider what it would look like to build a more "unbiased" or "fair" algorithm. For example, what would be required? Is this even possible in a diverse world? These and other questions raised in the lesson—including how to create less biased training data and whether people have a right to remove themselves or their work from training data—are deeply ethical ones that students must learn to weigh as various AI applications become more pervasive in our world.

Dispositions.

This lesson helps students develop critical dispositions about algorithmically produced information, including being able to reflect critically on structures and biases underlying existing and emerging AI technologies and beginning to consider possible responses to algorithmic bias like opting out or raising awareness.



FINAL THOUGHTS

The need for curricular and pedagogical responses to address online prejudice, bullying, and disinformation is immense. In countless ways these problems constrain the quality of democratic discourse and, in turn, our collective pursuit of a more democratic society. To be sure, more work is needed. But if schools are to remain a foundational support for a democratic society, then such efforts will be vitally important. ■

²⁴ <https://craft.stanford.edu/resource/how-does-algorithmic-bias-impact-different-ai-applications/>

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