



Teaching Critical Thinking in K-12: When There's A Will But Not Always A Way

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Executive Summary

When asked to rank the skills they most want in their employees and co-workers, employers and human resource professionals almost always put [critical thinking](#) at or near the top of the list. Yet these same business leaders have long [lamented a lack of critical thinking](#) skills in the people they hire.

The general public is near unanimous in its support of critical thinking. Our 2021 survey found that [95 percent of Americans](#) believe that critical thinking skills are important in today's world, yet 85 percent of the respondents said critical thinking skills are lacking in the general public.

Why the gap? If there is near universal agreement that critical thinking skills are essential for success in work and life, why are so many people so bad at it?

New survey data from the [National Assessment of Educational Progress \(NAEP\)](#) sheds some light on the issue. The data from NAEP – an educational assessment known as The Nation's Report Card – shows a gulf between the desire to teach students how to think critically and the amount of time teachers spend doing so. According to NAEP, the teaching of critical thinking skills in America's classroom is uneven at best and in some cases is happening only rarely.

Why the gap? If there is near universal agreement that critical thinking skills are essential for success in work and life, why are so many people so bad at it?

According to NAEP, which provides national, state, and district-level results about students' academic achievement and learning experiences, fewer teachers than one might expect reported implementing key elements of critical thinking in a meaningful way:

- Only seven states – among them Florida, Georgia, Louisiana, Mississippi, and New Mexico – had at least 50 percent of their 8th grade teachers report that they place “quite a bit or a lot of emphasis” on teaching their students to engage in deductive reasoning – a vital component of critical thinking.
- Nationally, only 39 percent of 8th grade teachers reported putting “a lot” of emphasis on deductive reasoning.
- When it comes to teaching students how to solve problems, the picture is brighter, with 81 percent of 8th grade teachers nationally reporting that they “place ‘quite a bit’ or ‘a lot of emphasis’ on teaching their students to use a problem-solving process.”

But again, implementation of even problem-solving processes is uneven and spotty. With two states (Florida and Georgia) reporting that's true for 90 percent of teachers, while four others (Alaska, Hawaii, Iowa and North Dakota) reported a rate below 70 percent.

Why Critical Thinking Matters

A commitment to developing and nurturing informed and thoughtful students can translate into an effective, engaged, and empathetic citizenry that is capable of great contributions to the nation and to the world.

The ability to think critically about information is a core skill valued by both colleges who want it emphasized and [employers who want it exercised](#) in the workplace in order to facilitate greater innovation, efficiency, and profits.

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This core skill also serves to safeguard the public in key ways:

- Critical thinking is a hallmark of good citizenship. It can help shape public perception of current events, from politics to healthcare. The ability to think critically in all aspects of our lives is vital to understanding issues such as the pandemic, the Jan. 6 attack on the U.S. Capitol, climate change, and the debate around critical race theory, equity issues, and so much more.
- Critical thinking skills are also imperative when it comes to combating our intrinsic cognitive biases. From fighting the “[Dunning-Kruger effect](#)” which leads people to overestimate their knowledge and abilities – especially in areas where they have little to no experience, to “[confirmation bias](#),” which entices us to favor information that confirms our existing beliefs instead of thinking objectively about the facts presented.
- Lastly, but importantly, [research has shown](#) that people with better critical thinking skills have fewer negative life events than those who are merely “intelligent.” “Negative life events” are things like more credit card debt, extra-marital affairs, or driving under the influence.

Ultimately, someone who is well practiced in critical thinking skills is better equipped to make the best decisions in their personal lives – be it healthcare choices, voting, selecting news sources, social engagement, or when making financial decisions such as financing a home purchase or managing debt.

Thus, forming the building blocks of good critical thinking habits in K-12 can foster life-changing results that benefit each individual as well as society as a whole.

The National Assessment of Educational Progress

In an effort to provide a better look at the status of critical thinking education and implementation in K-12 schools, Reboot examined survey questions from the 2019 NAEP background questionnaire, the most recent available. Specifically, Reboot looked at teachers' self-reported efforts around teaching and instilling critical thinking skills in their students.

The National Assessment of Educational Progress is designed to provide key [information about student achievement](#) and learning experiences in various subjects. Known as The Nation's Report Card, NAEP is a congressionally mandated program that is overseen and administered by the National Center for Education Statistics, within the U.S. Department of Education and the Institute of Education Sciences. Since 1969, NAEP data has provided insights and results that help to drive improvement in education policy and practice. Results are available for the nation, states, and 27 urban districts. The National Assessment Governing Board, an independent body appointed by the Secretary of Education, sets NAEP policy and the national report card takes a look at a broad array of study areas.

In order to provide a comprehensive look at student progress, NAEP tests a range of subjects at grades 4, 8, and 12 to provide a broad look at a student's education. Subjects include civics, economics, geography, mathematics, music and visual arts, reading, science, technology and engineering literacy, U.S. history, and writing.

Reboot wanted to better understand how teachers felt they were doing in showing students in elementary and middle school how to problem solve in different ways. NAEP's 2019 survey of teachers included questions on these topics. Those questions were:

- *What percent of 4th grade teachers placed "quite a bit" or "a lot of emphasis" on teaching their students to use alternate methods to solve problems?*
- *What percent of 8th grade teachers placed "quite a bit" or "a lot of emphasis" on teaching their students to use a problem-solving process?*
- *What percent of 4th grade teachers placed "quite a bit" or "a lot of emphasis" on teaching students to understand tools for problem solving*
- *What percent of 8th grade teachers placed quite a bit or a lot of emphasis on teaching their students to engage in deductive reasoning?*

At the heart of critical thinking implementation is how well educators feel they are doing in teaching kids to use the problem-solving processes that could guide how they approach challenges in school and beyond.

Finally, how well are teachers doing when it all comes together and students must utilize deductive reasoning? Are schools failing to teach kids how to make logical inferences and arguments?

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What the Survey Says

In general, the NAEP national data reveals that most educators are trying hard. When it comes to alternative problem-solving methods, 86 percent of 4th grade teachers said they put “quite a bit” or “a lot of emphasis” on that skill. Also in fourth grade, 75 percent of teachers reported that they place “quite a bit” or “a lot of emphasis” on teaching students to understand [tools for problem solving](#). As positive as those numbers are, however, teachers in 8th grade appear to be dedicating far less effort to [teaching critical thinking skills](#).

The percent of 8th grade teachers who placed “quite bit” or “a lot of emphasis” on teaching their students to use “a problem-solving process” received was 81 percent nationally, however when it came to placing “quite a bit” or “a lot of emphasis” on teaching deductive reasoning, the numbers fell to only 39 percent. States scoring lowest on this question were Minnesota (22 percent), Iowa (23 percent), North Dakota (24 percent), and Oregon (24 percent).



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This is notable because [the steps involved in deductive reasoning are important critical thinking skills](#). Critical thinking requires “going deep,” drawing on well-researched ideas and facts. This is where evidence is analyzed, data and facts are gathered, and where extraneous or illegitimate information is sifted from the important and the pertinent. Next, good critical thinkers use that evidence to [confirm or discount a hypothesis](#), and they engage in thoughtful, logical reflection, making sure that they’ve truly backed up an idea or an approach with evidence and reason.

Furthermore, the percentage of 8th grade teachers who reported that they “often” or “always” ask their students to analyze two or more texts on the same topic came in at 57 percent nationally,

and the percent of 8th grade teachers who place “quite a bit” or “a lot of emphasis” on critiquing text was 63 percent. Again, these are skills central to good critical thinking which demands that individuals expand their perspective by looking at problems in different ways, from different vantage points. This is particularly important when working with others.

While the teacher responses on most critical thinking skills rose slightly between 4th and 8th grade – with the notable exception of deductive reasoning instruction – the numbers overall reflect a missed opportunity. Experts in the adolescent brain say critical thinking education should be accelerating in the middle school years, yet the NAEP survey data indicates that is not generally happening to the extent that it could be.



Developmental psychologists have noted that beginning at around age 13, adolescents can begin to acquire and apply formal logical rules and processes. If rudimentary logic has been learned earlier, teachers can now build upon it by teaching teens advanced logical notation and vocabulary.

In the teenage years, social pressures accelerate, and with the internet and social media, these pressures move faster and with more force. Critical thinking skills can prove to be a valuable resource for teenagers to help cope with these pressures. Critical thinking can also play a role in helping young adults choose and pursue long-term academic or career goals, by helping them construct long-term plans. Finally, [critical thinking is an indispensable tool in helping young people understand and analyze the wealth of information sources](#) now bombarding them.

A Lack of Standards and Resources

A measurable trend and bright spot in the NAEP data is that in most states there is a desire by teachers to incorporate critical thinking skills into the classroom.

The will is there; but not always the way.

One problem is a lack of a shared standard that would help schools to teach critical thinking skills. The closest thing there is to a national standard for critical thinking is the Common Core State Standards, a set of academic recommendations across subject areas that do have, embedded within them, some critical thinking components, such as problem-solving and analytical skills.

However, the Common Core, as the standards are known, is highly controversial. Currently, 10 states have either never adopted the standards or have repealed the standards after initially signing on. Collectively, these non-participating states are home to nearly 15 million students – meaning that nearly 30 percent of the nation's school children are not benefiting from the critical thinking components that are embedded in the Common Core.

Without a shared standard or consensus around critical thinking education, implementation or measurement, each state and district is left to try and determine on their own how to best teach critical thinking skills.



When 8th grade teachers were asked how much they emphasized teaching students to engage in deductive reasoning, Minnesota (22 percent), Iowa (23 percent), North Dakota (24 percent) and Oregon (24 percent) ranked at the bottom – some 15 percentage points below the national average. Teachers in states such as Mississippi (61 percent), Louisiana (57 percent) and Georgia (52 percent) self-reported among the highest rates. (It is worth noting that, in many [other measures](#) of educational quality, Mississippi and Louisiana routinely rank near the bottom, while Minnesota and Iowa usually rank in the top half of states.)

So is this data point accurate? Or is it reflective of how teachers “feel” they are doing? Without shared standards or agreement on what critical thinking education is, it is hard to know.

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When [Reboot surveyed teachers in 2020](#), they reported dissatisfaction with how well states were assessing critical thinking skills in students: 25 percent of teachers (a plurality in the survey) said they believed that their state’s standardized tests did not assess critical thinking skills well at all versus 13 percent who said they believed state exams assessed critical thinking skills extremely well.



That same survey asked teachers about their ability to teach critical thinking skills to their students. In the survey, educators repeatedly mentioned a need for more resources and updated professional development. In response to a Reboot question about how administrators could help teachers teach critical thinking more effectively, one teacher asked for “better tools and materials for teaching us how to teach these things.”

Others wanted more training, asking directly for additional support in terms of resources and professional training. One educator put it bluntly: “Provide extra professional development to give resources and training on how to do this in multiple disciplines.”

These comments [echo ones made earlier](#) in a 2019 global survey on critical thinking skills by [Cambridge](#), which found:

- “93% of teachers agreed that it’s important to develop students’ critical thinking skills but only 21% agreed that they have all the materials they need to develop these skills.
- Teachers cited a lack of regular training as an obstacle to teaching critical thinking, with only 17% saying that they’ve had specific coaching on teaching these skills. Another major obstacle was a lack of time: 50% agreed that they struggle to find the time to develop effective means to teach critical thinking skills.”

Conclusion

It is extremely positive that a large swath of the population values critical thinking and agrees that it should be taught throughout K-12, and that it is a critical life skill. The lack of a clear path forward to meet this sentiment is discouraging.

As noted in our [2020 State of Critical Thinking report](#) that surveyed educators: “Over the course of the last few decades, K-12 educators have been urged to teach critical thinking, but they have been given conflicting and inconsistent advice on how to do it. There remains a lack of proven resources for them to rely on, a lack of administrative support—and sometimes even a lack of a clear sense of what exactly critical thinking is. Perhaps most importantly, teachers lack the time and freedom within the curriculum to teach these skills.” The 2019 NAEP survey data supports this belief.

It is vital to remember, however, that critical thinking is not a destination, but rather a journey. There is no critical thinking certificate to be earned at the conclusion of a series of tests or steps. Instead, critical thinking consists of a commitment to develop and use a set of skills that enables people to assess the vast array of information coming at them. With sharp critical thinking they can make decisions and form opinions in a thoughtful, measured, and informed manner. With that in mind, the type of support teachers need to best instruct students and incorporate critical thinking into their lessons requires a fresh approach.

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New research by Reboot and [researchers from Indiana University](#) explores innovative, inexpensive and scalable ways to teach critical thinking skills. The research found that educators and others can teach and hone essential critical thinking skills using a simple method that is easy to implement across diverse groups of students. The driving impetus enabling this breakthrough – and that will help push critical thinking education forward now and in the future – is the understanding that developing these skills involves cognitive development in a number of different areas and integrated with general knowledge learned in other subject areas.

Critical thinking education and interventions that ignore this basic fact may produce some gains, but may not produce lasting ones.

In short, critical thinking skills cannot be extricated from the lessons taught in math, history, science, or language arts. Rather critical thinking helps explain, amplify, and support the lessons learned in these subjects and in the challenges people face in their everyday lives. By adopting an approach to critical thinking education that acknowledges and incorporates this tenant, teachers, administrators and schools are best positioned to help students develop a strong, lifelong foundation in critical thinking.

Tables

Percent of 8th grade teachers who place “quite bit” or “a lot of emphasis” on teaching their students to [engage in deductive reasoning](#)

Bottom 10

| | |
|--------------|-----|
| National | 39% |
| Minnesota | 22% |
| Iowa | 23% |
| North Dakota | 24% |
| Oregon | 24% |
| Rhode Island | 25% |
| Colorado | 28% |
| Wyoming | 28% |
| Hawaii | 29% |
| Indiana | 29% |
| Utah | 29% |
| Wisconsin | 29% |

Top 10

| | |
|----------------|-----|
| National | 39% |
| Mississippi | 61% |
| Louisiana | 57% |
| Georgia | 52% |
| Delaware | 51% |
| Florida | 50% |
| New Mexico | 50% |
| Texas | 50% |
| Maryland | 48% |
| Tennessee | 48% |
| New Jersey | 44% |
| South Carolina | 44% |

Percent of 8th grade teachers who place “quite bit” or “a lot of emphasis” on teaching their students to [use a problem-solving process](#)

Bottom 10

| | |
|--------------|-----|
| National | 81% |
| Iowa | 61% |
| Hawaii | 66% |
| Rhode Island | 69% |
| Alaska | 69% |
| North Dakota | 69% |
| Oregon | 70% |
| Kansas | 70% |
| Utah | 71% |
| Wisconsin | 72% |
| Colorado | 72% |
| Vermont | 73% |

Top 10

| | |
|---------------|-----|
| National | 81% |
| Florida | 92% |
| Georgia | 90% |
| Texas | 89% |
| Mississippi | 88% |
| Maryland | 88% |
| Delaware | 87% |
| New Jersey | 87% |
| Louisiana | 86% |
| Arkansas | 85% |
| West Virginia | 85% |
| Ohio | 85% |

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The Reboot Foundation is devoted to elevating critical thinking. In a time of vast technological change, the foundation aims to promote richer, more reflective forms of thought in schools, homes, and businesses. Reboot funds efforts to integrate critical thinking into the daily lives of people, and it conducts surveys, opinion polls and original research.

For more information please visit: reboot-foundation.org

