Fit for Purpose? How Today's Commercial Digital Platforms Subvert Key Goals of Public Education

Faith Boninger
University of Colorado Boulder

T. Philip Nichols
Baylor University

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National Education Policy Center

School of Education
University of Colorado Boulder
nepc.colorado.edu

Acknowledgements

NEPC Staff

Faith Boninger
Publications Manager

Margaret Balch-Gonzalez
Academic Editor

Elaine Duggan
Production Design

Alex Molnar
NEPC Director

Kevin Welner
NEPC Director

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T. Philip Nichols, Baylor University

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I. Executive Summary

Digital educational platforms have become ubiquitous in American classrooms. Educators use platforms like Google Workspace for Education, Kahoot!, Zearn, Khan Academy, MagicSchool, and countless others to organize and provide curriculum content, structure classroom teaching and student collaborations, assess and track student learning, and communicate with parents and guardians. There are now vanishingly few facets of teaching and learning in schools that are not in some way shaped by digital platforms.

This ubiquity can make it hard to remember that it was not always like this. More importantly, it can undermine our ability to consider that digital platforms may often not be the best way to achieve the purposes of public education. The technology industry has been marketing its wares to teachers and administrators for years as a way to more efficiently and effectively organize and operate schools for instruction and learning. Although these campaigns had only moderate success before the COVID-19 school closures, the resulting exigencies opened the door for the industry's message and products to be accepted by even the most reluctant schools.

The "ed tech" platforms used in schools, like other platforms used in all domains of modern life, differ in important ways from the software of the past. Today's platforms extract data from their users not only to draw inferences about them; they also seamlessly "interoperate" with other platforms. Educators tend to think of ed tech platforms as merely "tools" they adopt for specific, self-contained purposes, but these platforms are actually complex "*ecosystems*" shaped by competing interests and imperatives that operate out of sight and far from schools.

Administrators, teachers, and students may perceive themselves to be the primary "market"

for ed tech platforms. In fact, they are only one market. In addition to their use in product development, the data digital platforms collect are sold off in a dense and well-developed marketplace of advertisers, data brokers and investors. The same platform that delivers curricular materials to students also harvests, for example, those students' usage patterns, performance data, and engagement metrics. All of these are valuable assets that platform owners can leverage to enhance their own products, reinforce their market advantages, or monetize through third-party data sharing, often without the knowledge or consent of students, families, or educators. Such dynamics distinguish today's platforms from traditional ed tech tools like graphing calculators or overhead projectors, which served a single purpose once purchased and which were unambiguously under the control of the schools that purchased them.

An ecological perspective reveals how platforms operate across multiple dimensions simultaneously. On the surface, ed tech platforms have recognizable uses for administration, instruction, assessment, and communication. However, just beneath the surface is a deeper level of technical architectures—code, data, algorithms, interfaces, hardware—that shape what kinds of usage are possible. Furthermore, this technical dimension is governed by a deeper level of political-economic relations: the ownership structures, commercial imperatives, and material resources that power each platform's operations.

For educators, community leaders, and policymakers, adopting an ecological orientation means moving beyond questions of tool selection ("What's the best app for assessing writing?") and tool management ("How do I prevent students from misusing this platform?"). Instead, it invites careful consideration of how platform ecosystems work, and for whom: What are the wider implications of integrating them into school communities? What values are embedded in their design? What fiscal and human resources do they require to function?

To ensure that any digital platform is appropriate, a school must first clearly articulate its own needs, values, and goals. Only then can a school meaningfully determine whether or not a digital platform supports or undermines the school's purposes and whether or not those purposes might be best achieved by nondigital means. This approach can buffer decision-makers from relentless marketing and empower them to adopt only those platforms that support their self-determined aims. School leaders also need higher-level policy support as a backstop against the negative consequences of ed tech. Federal policy, in particular, currently is imprudently promoting artificial intelligence (AI) as a means of modernizing education and creating a 21st-century workforce. Since AI amplifies the negative effects of ed tech platforms, schools have good reason to delay and first carefully consider the adoption of those platforms.

To enable schools to make the best choices for themselves regarding digital educational platforms, we recommend that:

Teachers and Educational Leaders:

- Limit educational screen time, particularly for young students.
- Clearly articulate the pedagogical values, goals, and practices they seek to achieve.

- Use these criteria as a standard by which to evaluate any digital platform considered for adoption.

State Policymakers:

- Establish an independent government entity charged with ensuring the quality of all digital educational platforms to be used in schools, including platforms incorporating artificial intelligence (AI).
- Charge this entity with reviewing and approving the pedagogy and programming of platforms, before their implementation and periodically thereafter.
- Require that platforms' programming be transparent and amenable to review.
- Create standardized contract templates that include mandatory clauses to protect student data, including by establishing mandatory deletion timelines, requiring plain-language privacy policies and regular third-party audits of data practices, prohibiting unilateral changes to terms of service mid-contract, and guaranteeing data portability when services are discontinued or districts change providers.
- Adopt regulations prohibiting schools from using any technology, including AI models, whose workings are not transparent to state regulators, unless they provide a well-developed rationale for why this technology is the only way to achieve a clearly defined and valid school purpose.

Federal and State Policymakers:

- Stop uncritically promoting AI, which amplifies threats associated with digital educational platforms, as a way to transform and modernize schools' pedagogical and administrative practices.

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II. Introduction

Digital platforms have become ubiquitous in American classrooms. Educators use them for delivering and supplementing curriculum, assessing and tracking student learning, supporting classroom collaboration, and communicating with guardians.[1] Indeed, in 2025, there are vanishingly few facets of teaching and learning in schools that are not facilitated with platforms.

This ubiquity can make it easy to forget that it was not always this way. For decades, the tech industry marketed its products to schools, urging teachers and administrators to optimize and modernize their practices by adopting the "personalized learning" and "competency-based" approaches to education especially amenable to the constant data collection and assessment their products offer.[2] Until recently, this marketing was only moderately successful. Although individual companies made inroads, particularly as districts struggled to meet their ever-shrinking budgets, digital platforms were much less pervasive in schools as recently as 2019. The school closures caused by the COVID-19 pandemic led schools across the world—even those most reluctant[3]—to expand the adoption of digital platforms in order to continue their work.[4]

Although they may look and feel similar to earlier digital technologies, "platforms" do more than simply deliver a service. They also extract data from their users in order to draw inferences about them and their use of the product.[5] A platform may use this data as part of the primary service it provides or share it with other educational services. For example, a platform providing assessment could also feed data into administrative platforms that track student achievement and into instructional platforms that use AI to personalize future assignments. The platform's provider may also use this data for commercial purposes—for example, to develop or market products or to sell to or share with other businesses.[6,7]

Despite the problems that schools experienced with many platforms during the pandemic closures, they have continued to use them.[8] And since the November 2022 release of ChatGPT, education technology ("ed tech") companies have promoted a wide range of products incorporating generative artificial intelligence (AI) that they claim can both reduce teachers' workload and increase student engagement.[9] Teachers receive daily emails from companies offering trainings and webinars to demonstrate the value of their ed tech products, especially those featuring AI.[10,11] A given district can offer hundreds of such products for teachers to choose from, and it may mandate the use of some. Many districts, for example, use a single learning management system.[12,13] While they may dislike or distrust some platforms, teachers with large classes likely welcome those that promise to streamline their workload by, for example, reducing the time they spend grading or communicating with students' families.

However, the apparent promise of ed tech platforms masks significant concerns. While teachers are the best judges of which platforms actually save them time, research does not support claims that ed tech platforms improve upon traditional, low-tech schooling.[14] Likewise, research does not support the efficacy of introducing AI into educational processes.[15] Evidence is also accumulating about the negative effects of young people's technology use—on the quality of their education, their mental and physical health, and their privacy.[16]

International responses to these concerns reveal both the possibilities and challenges for addressing them. The European Union (EU), for instance, has enacted important privacy legislation that provides rights and protections to EU citizens that are not extended to U.S. users. In 2024, Sweden, one of the first countries to adopt digital learning nationwide, developed policies to replace screen time with books, citing scientific studies that "show that screen-free environments provide better conditions for children to develop relationships, concentrate and learn to read and write."[17]

The apparent promise of ed tech platforms masks significant concerns.

Other attempts to control the use of digital platforms have been more uneven. In 2022, Denmark made news when one of its municipalities learned about data security concerns associated with students' use of YouTube and Chromebooks.[18] Denmark's Data Protection Agency temporarily banned Google from Danish schools; however, permanently evicting Google, which is entrenched in the Danish government's digital systems, proved difficult.[19] In the end the Data Protection Agency, over the course of several years, negotiated changes to the contracts that govern Google's use of Danish students' data.[20]

U.S. schools face similar struggles with even less regulatory support. Districts are aware of threats to student data privacy, and in many states they must comply with laws that ostensibly protect students' data from unauthorized use. But these laws are often inadequate. The state of Colorado, for example, requires vendors contracting with schools or educational agencies to meet certain requirements if they are to collect student data.[21] However, the law exempts many vendors from these obligations by classifying their services as "on demand" rather than contractual.[22] It also fails to provide oversight to ensure that districts are complying with the law.[23]

Districts, for their part, try to vet platforms and provide their staff with lists of those they may use. But they need staff with time and expertise to review privacy policies that are often hard to understand—a demand that may stress under-resourced districts, in particular. Districts may also struggle to prevent teachers from using unapproved products. And, as in Denmark, their operations may be too entwined in large digital systems to contemplate disengaging from them.[24]

Beyond privacy concerns, ed tech platforms also shape educational practices in ways that may go unexamined. Although teachers and ed tech companies often think of platforms as "tools" for specific tasks (e.g., learning management, gamified instruction, math practice), in reality, they are much more complex.[25] Even platforms that claim to align with state standards or evidence-based practices can have negative pedagogical effects. Countless design decisions influence the look, feel, and function of ed tech platforms. For instance, color choices may prevent students with limited vision from comfortably using the platform;[26] wording of feedback may influence whether students persist or disengage from a lesson;[27] and default data sharing settings may determine what data flows to third-party vendors. Design decisions reflect product developers' biases and assumptions[28] and also their corporate business imperatives.[29] This wider "ecosystem" of ed tech also ties schools to particular consumption habits and spending priorities.[30] What must schools give up to fund ed tech contracts, laptops, IT support, and data security measures?

This brief reviews research examining pedagogical, logistical, and ethical implications of ed tech platforms for schools and school communities. Our analysis of the wider ecosystem of digital educational platforms—how they are so much more than simple "tools"—leads to recommendations for how teachers, school and district leaders, and other policymakers can develop policies to govern their use.

III. Review of the Literature: Big Promises, High Costs, No Results

Ed tech has a long history of promising efficiency and modernization. As early as the 1920s, purveyors of radio and recording technologies encouraged schools to adopt their products to streamline the delivery of curricular content.[31] Since then, film projectors, "teaching machines," television, computers, and digital platforms have each, in turn, captured the imagination of those eager to optimize educational processes.[32,33] Marketing for each of these innovations has centered on its potential to increase the efficiency of teaching large numbers of students and to provide educators with more time for individualized instruction. These same promises continue to drive 21st-century ed tech marketing.[34]

The appeal of digital ed tech platforms is relatively straightforward: They offer school leaders solutions to ever-pressing concerns. They promise to optimize educational processes by supporting the data collection and analysis schools use to identify and address administrative and instructional needs. For example, the math-teaching platform Zearn, in its paid school and district services, offers "snapshot reports with actionable insights on implementation progress at every level" and "on-demand district-wide reporting for data-driven de-

cision making."[35] Administrators, frequently facing financial pressures, welcome platforms that have potential to simplify data collection and interpretation to support their budgetary decision-making.

Digital platforms also promise to help schools and districts "modernize" their educational processes. Marketing for these platforms portrays them as "innovative" and future-oriented, providing the infrastructure schools need to streamline and personalize instruction, close "gaps" in student access to technology, and meet evolving college-and-career readiness expectations.[36] School and district leaders under pressure to improve the quality of the education they offer by modernizing it—as well as teachers eager to engage students and support achievement—may find these claims especially compelling. For these reasons, some of the most popular platforms are learning management systems that provide a central hub to coordinate a variety of tasks for students, teachers, administrators, and families (i.e., course management, curriculum delivery, grading, data reporting, and communication). Others provide curriculum and assessment supports, especially those that promise to engage student interest through gamification and personalization and to provide actionable data for teachers and administrators. Concerns remain, however, about the risks involved in relying on and exposing students to digital platforms. And digital platforms raise pedagogical, logistical, and ethical challenges for educational leaders and teachers who are considering adopting them.

Pedagogical Challenges: No Evidence of Improved Learning

Overall, research has not supported the common-sense presumption that digital approaches to schooling are better than non-digital alternatives.[37] At the broadest level, widespread computer use in education has been found to be associated with lower student achievement. In the United States, scores on the National Assessment of Educational Progress (NAEP) began deteriorating in 2012,[38] when many schools began providing individual digital devices to students. Internationally, the Organisation for Economic Co-operation and Development (OECD) reported declines in student reading performance "in countries where it is more common for students to use the Internet at school for schoolwork."[39] In 2023 the OECD found that while an hour or less of computer-based learning was associated with higher math scores on the 2022 Programme for International Student Assessment (PISA exam) compared to no computer-based learning, that effect disappeared and then reversed as screen-time increased.[40]

Moreover, there is little evidence that digital platforms, in particular, improve teaching and learning. A 2023 UNESCO report attributes this dearth of evidence to the rapid pace of technological development, with ed tech products changing, on average, every 36 months.[41] Although "personalized learning" continues to be widely touted, evidence does not support claims that it increases student achievement.[42] The RAND Corporation's extensive study of schools that adopted personalized learning practices schoolwide was inconclusive.[43] Summit Public Schools, a charter school organization that disseminated a blended learning program to nearly 400 U.S. schools by 2018, could not substantiate its claims that the program led to academic success.[44] A 2019 study of five Elizabeth, NJ schools that adopted the program "Teach to One: Math" found no clear evidence of the platform's positive effect on student

math performance.[45] Studies conducted or sponsored by ed tech companies about their own products typically lack credibility and rarely stand up to scrutiny.[46,47] Researchers also question the implications of "datafying" pedagogy, such that things computers can measure (e.g., response times) become the metrics schools value.[48] Others argue that teachers better engage students by recognizing their personhood within communities of learning rather than isolating them in individualized digital tasks.[49]

In addition to the lack of evidence that digital platforms improve learning, schools face considerable logistical challenges in adopting them.

Logistical Challenges: Compatibility, Interoperability, Maintenance Costs

One logistical challenge is the compatibility of new platform technologies with existing information technology (IT) infrastructure. Many schools operate with aging hardware, limited bandwidth, or legacy software systems that cannot support the latest cloud-based applications.[50] As a result, districts must often choose between investing in costly upgrades or limiting their platform adoption. Increasingly, the pressure to "modernize" education has skewed such decisions toward technological procurement: As state assessments and commercial exams (e.g., the SAT, Advanced Placement tests) transition to adaptive online formats, districts have little choice but to keep pace, allocating funds to purchase (and replace) laptops and tablets, and expand their broadband capacity and data storage.[51]

A related challenge pertains to "interoperability." As districts accumulate platforms for learning management, assessment, and communication, they often discover these systems cannot "interoperate," or share data and function cohesively with one another. Recent U.S. National Education Technology Plans have thus emphasized the importance of interoperability in district and school ed tech adoption.[52] However, this demand for interoperability creates new challenges, leading educators to prioritize the procurement of integrated software ecosystems rather than selecting the most pedagogically appropriate platforms for their instructional or administrative needs. Moreover, it can force schools to cede such decisions to platform providers themselves. A district that adopts Google Chromebooks, for example, may find itself unable to use desired applications, not due to technical incompatibility, but because they are not included in Google's proprietary "marketplace."[53]

One important difference between past and present ed tech has been the shift to subscription-based funding. When computers first entered classrooms, schools owned the software they used. By contrast, today's "software as a service" (SaaS) approach allows vendors to provide software platforms over the internet, on demand and on a subscription basis.[54] It also allows them to manage, maintain, and update the software as needed.[55] While this frees subscribers from needing to purchase updates, it also ties them to paying "rent" to continue using the software and reduces their control over updates.[56] Terms of service and privacy policies for SaaS applications often warn that if the vendor changes any policies or features, subscribers provide de facto consent by continuing to use the service—or they must stop using it.[57] Schools face difficult choices when this happens, as they did when Google changed its storage limits in 2023 and began charging for previously free services. If they did not

want to pay, districts that had invested substantial time, energy, and money transitioning to Google's Workspace for Education, cloud storage, and Chromebooks faced equally costly transitions to alternatives.

Unlike traditional one-time purchases, subscription-based SaaS models create recurring fiscal obligations for districts, transforming capital expenditures into operational costs that strain already limited budgets.[58] And because platforms continuously update their features, interfaces, and functionality, often with minimal notice or consideration for academic calendars, they require constant attention from IT staff to maintain system functionality. This creates burdens to continually retrain educators, troubleshoot technical issues, and reconfigure integrations with other systems, depending on the scope of platform updates. Over time, districts can find themselves locked into using particular platforms not because they are superior, but because sunk financial and labor costs create prohibitively high barriers to switching—even when better alternatives emerge.[59]

Ethical Challenges: Privacy, Algorithmic Bias, Psychological and Health Harms

Ethical concerns related to ed tech platforms involve both developers' deliberate choices and the sometimes unintended results of those choices. First, businesses choose which data their platforms collect from students, and how to use that data.[60] Many states have adopted policies exempting platforms that claim to "personalize" learning from restrictions on data collection designed to protect student privacy.[61] Because student data is necessary for platforms to generate "personalized" outputs, this exemption creates a loophole for providers to use the data they harvest for commercial purposes, such as software development and marketing. Also, rather than safeguarding "student data" in general, state and federal laws only protect "personally identifying" data while allowing ed tech providers to use "de-identified" information for their own purposes—again, including marketing and product development.[62]

Beyond privacy, algorithmic systems introduce additional ethical risks—as is evidenced by a substantial and growing body of research.[63] Facial recognition systems, for example, identify Black faces less accurately than White faces. When used to verify student identity for testing purposes, such systems sometimes fail to recognize Black students.[64] Artificial intelligence (AI) models, in particular, incorporate biases from their training data that transfer to their educational applications.[65] For example, Turnitin's plagiarism-detection products claim to identify AI-generated text.[66] However, the hurried integration of AI detectors into such products in 2023 led to a surge in false accusations of cheating.[67] Such accusations disproportionately affect non-native English speakers, who tend to write in simpler sentences that AI flags as suspicious.[68] Similarly, automatic essay-grading algorithms used in many states tend to reward sophisticated language and structure, regardless of the quality of an essay's content.[69]

A 2025 Georgetown University study of AI platforms that generate automated Individualized Education Plans (IEPs) found that the platforms offered different recommendations for students based on their gender, even when everything else about the students was the same.

Schools that adopt such biased recommendations may violate state laws.[70]

Health impacts are also an ethical concern. Guidelines from the American Academy of Pediatrics and American Psychological Association advise limiting social media use but generally ignore technology use in schools.[71,72] This carve-out for education is questionable, especially as students use classroom collaboration platforms like Google Docs to chat and gossip, and YouTube to watch non-assigned videos.[73] YouTube, a Google application, is one of the most ubiquitous platforms used in schools.[74] Its algorithms, like those of social media platforms, have been demonstrated to quickly recommend content that promotes depression, body dysmorphia, eating disorders, and excessive exercise.[75] Excessive screen use—whether for educational or non-educational purposes—has also been linked to physical effects including myopia, poor posture, and musculoskeletal injury.[76]

IV. Recent Developments: COVID-19 and Artificial Intelligence

The COVID-19 pandemic accelerated a transformation in schools' relationship with digital technologies that was already underway. If they hesitated before, many school leaders suddenly felt they had no choice but to adopt digital learning while their schools were physically closed.[77] Technology industry leaders promoted the idea that the pandemic was an opportunity to reimagine education and that this would inevitably institute a "new normal."[78] They also funded and promoted the realization of this vision.[79,80] Researchers Ben Williamson and Anna Hogan tracked the free or heavily subsidized arrangements schools entered into with Google and Microsoft during the lockdowns and warned that these attachments would be hard to sever once the pandemic receded.[81] Since then, the scale of platform adoption has been staggering. Outside of Google and Microsoft's offerings, thousands of products are now available to schools. HolonIQ selected its top 1,000 ed tech start-up companies from *10,000* nominations.[82] The Learn Platform, a subsidiary of Instructure, found that the 436 districts it studied used, on average, over 2,700 distinct ed tech products during the 2023-2024 school year.[83]

Just three years after the onset of the pandemic, OpenAI released its generative artificial intelligence (AI) chatbot, ChatGPT, introducing another wave of disruption. Much early decision-making about generative AI in schools revolved around whether to let students use chatbots. More significantly, ed tech providers began incorporating generative AI into new and existing products to support both instructional and administrative tasks (many products, such as adaptive learning platforms, had already incorporated predictive AI).[84] Now, schools and districts may (1) choose to adopt AI platforms (e.g., MagicSchool, Khanmigo); (2) encounter AI as optional features in platforms they already use (e.g., Google, Kahoot!), or (3) be forced to use AI as companies incorporate it into their platforms (e.g., PowerSchool). "Big Tech" companies already established in education now increasingly fold proprietary, competing, large language models (LLMs) into their services.[85] In July 2025, the American Federation of Teachers (AFT), Microsoft, OpenAI, and Anthropic announced their joint creation of a "National Academy for AI Instruction" to offer "free AI training and curriculum for all 1.8 million members of the AFT, starting with K–12 educators."[86]

Districts and states are increasingly trying to provide guidance for the use of AI in education, but its integration into platforms used in schools is moving faster than they can respond. According to a RAND Corporation survey, 25 percent of teachers and 60 percent of principals reported knowingly using AI in the 2023-2024 school year. Of the principals, only 18 percent reported that their schools or districts already provided resources to teachers, staff, or students on AI use in 2023-2024, and 23 percent reported that their schools or districts were in the process of creating policies.[87] By December 2024, another RAND survey of districts found that 48% of them reported offering some AI training for teachers.[88] In 2023, only 13 states had provided or planned to provide AI guidance to districts.[89] By 2025, that number had jumped to 28.[90] New state guidance is likely to follow the lead set by the federal government.[91]

At the federal level, policy has shifted to actively promote AI adoption. In April 2025, President Trump released an executive order establishing U.S. policy

to promote AI literacy and proficiency among Americans by promoting the appropriate integration of AI into education, providing comprehensive AI training for educators, and fostering early exposure to AI concepts and technology to develop an AI-ready workforce and the next generation of American AI innovators.[92]

The order established an "Artificial Intelligence Task Force" and laid out plans to encourage public-private partnerships to advance students' and teachers' AI usage, provide teacher training, prioritize research on applications of AI in education, and promote student apprenticeships in "AI-related occupations." It instructed the Task Force and federal agencies to prioritize funding these initiatives.[93,94] As of June 30, 2025, 68 primarily commercial entities promised to support the Trump administration's efforts by signing onto the White House Office of Science and Technology Policy's "Pledge to America's Youth: Investing in AI Education."[95] In July 2025, the U.S. Department of Education issued guidance encouraging schools to adopt AI applications in their teaching, learning, and administrative practices.

V. Discussion and Analysis: An Ecosystem Beholden to Corporate Interests

The combination of enthusiasm for and concerns about digital platforms in education can confound educators and school leaders. The perceived benefits and costs of a given platform are often two sides of the same coin. For example, the intensive data collection and processing that enable platforms to provide reports for optimizing teaching and learning also increase risks related to privacy and bias. Further, the strong imperative for schools to not fall behind the curve of "innovation,"[96] along with the sunk costs associated with ed tech adoption, increase educators' tolerance for platforms' drawbacks. Even egregious missteps by providers (such as the unauthorized use of, or failure to adequately protect, student data,[97] or AI-generated errors in the material presented to students[98]) do not necessarily dissuade schools from continuing to use a platform that promises benefits.[99]

In many cases, the downsides for schools of ceding their autonomy to platforms are difficult

to detect or easy to overlook. Examples include the excessive collection or unauthorized use of student data, bias in automated decision-making systems, and reports of student learning that ignore outcomes not easily measured by a computer. Meanwhile, benefits, such as simplification of grading and generation of shareable student data reports, are more immediate and visible.

To illustrate the challenges the research literature identifies, we examined a few popular platforms that offer a range of services that schools typically look for: learning management, curriculum and instruction, and assessment. Google's Workspace for Education,[100] an all-purpose learning management system (LMS), provides essential infrastructure; a communication interface between home and school; and a variety of additional services, such as search and YouTube. It also provides Google's Gemini (AI) as a core service in its Education Standard and Plus editions.[101] Kahoot!'s[102] platform for instruction and assessment features gamified learning of academic content; assessment; an AI "question generator"; and IBM SkillsBuild gamified quizzes (called "kahoots"). Zearn's[103] math content-area learning and assessment offers standards-based math curriculum; classroom- and school-level data analytics reports; and gamification. (See the Appendix for more detail about these products.) We chose these platforms as examples because of their popularity and the wide range of features they offer. The challenges they illustrate also characterize, to varying degrees, any of the platforms currently on the market.

Moving From "Tools" to "Ecosystems"

The relentless marketing and serious challenges outlined above complicate the common-sense understanding of ed tech platforms as "tools" that teachers or schools adopt for specific, self-contained purposes. Rather, these platforms function as complex "ecosystems" that integrate competing interests and imperatives into the instructional, learning, and administrative activities they facilitate.[104] The promised potentials of platforms to modernize education cannot be separated from their negative potentials to tether schools to the profit motives and design decisions of their owners. This is because, at their core, platforms seek to serve what economists call "multi-sided markets."[105] Administrators, teachers, and students may perceive themselves to be the primary "market" for ed tech platforms, but the platforms themselves are also beholden to the interests of advertisers, data brokers, investors, and their own developmental needs.

This multi-sided nature creates inherent tensions. The same platform that delivers curricular materials to students also harvests their usage patterns, performance data, and engagement metrics—all of which become valuable assets that platform owners can leverage to enhance their own products, reinforce their market advantages, or monetize through third-party data sharing, often without the knowledge or consent of students, families, or educators.[106] Such dynamics distinguish platforms from traditional ed tech tools, like graphing calculators or overhead projectors, which served a single purpose once purchased.

This ecological perspective reveals how platforms operate across multiple dimensions simultaneously. At the most visible level, ed tech platforms have recognizable uses for administration, instruction, assessment, and communication. But beneath this surface is a deeper

level of technical architectures—code, data, algorithms, interfaces, hardware—that shape what kinds of usage are possible. Further, this technical dimension is governed by an even deeper level of political-economic relations: the ownership structures, commercial imperatives, and material resources that power the platform's operations.[107] For educators and leaders, understanding platforms from this ecological perspective means moving beyond questions of tool selection ("What's the best app for assessing writing?") and tool management ("How do I prevent students from misusing this platform?"). Instead, it invites careful consideration of how platform ecosystems work, and for whom: What values are embedded in their design? What fiscal and human resources do they require to function? What are the wider implications of integrating them into school communities?

Transparency and Alignment

While ed tech platforms often promise to increase transparency in education by providing more data about what is happening in schools,[108] in practice, these expanded data processes can simultaneously diminish other forms of transparency—including those necessary for determining the quality and purpose of the data being collected and its alignment with the school's larger educational goals and values. Studies have shown, for instance, that the volume of data that platform technologies make available can be overwhelming for administrators and teachers to make sense of—much less to meaningfully inform their decision-making.[109] At a certain point of saturation, data may mystify, rather than clarify, what educators should pay attention to, or how they ought to define or respond to a given problem.[110] This contradicts platform providers' claims about making teaching and learning more transparent through data technologies.

Further complicating the notion of transparency, the "black box" nature of ed tech platforms means that not only can platforms' visible data cloud educators' judgments, but the technical processes that produce this data in the first place are obscured from view. This leaves educators unable to examine whether platforms' data gathering and analysis actually support their stated aims. For example, when Zearn advertises that its curriculum is "standards aligned," administrators and teachers cannot determine the quality or degree of this alignment. Zearn's website provides a state-by-state breakdown of the standards its product covers[111] and markets itself as capable of replacing, not just supplementing, a comprehensive K–8 mathematics curriculum.[112] Yet the adaptive data processes that determine how content is sequenced, how students are assessed, and how "mastery" is determined are hidden in the platform ecosystem's technical dimension.

While curricular alignment has always been challenging to measure,[113] established methods exist for evaluating the content of textbooks and print-based materials.[114] However, when the content of the curriculum exists only in a dataset, beneath a screen and cloaked in intellectual property protections and algorithmic inscrutability, such evaluations become impossible. Platforms that incorporate artificial intelligence are particularly opaque, as the mathematical calculations embedded in them are unknowable even to their own developers.[115] Schools paradoxically find themselves with more data than ever, but less context for understanding where it comes from, what it means, and whether it measures what educators intend.

Ed tech platforms' "alignment" issues also extend beyond standards to their fit with local educational values and community needs. Research has shown that the individualized learning experiences promoted by many platforms—i.e., those emphasizing skill acquisition through targeted, independent practice—can undermine education centered on collaborative knowledge construction and social development.[116] When platforms like Zearn promote "personalized learning," they implicitly advance a vision of education as something individual and linear.

Alluring as this vision may be from a standpoint of efficiency and individual achievement, it may sit uneasily alongside schools' commitments to cultivating creative problem-solving and democratic participation.[117] By embedding these value judgments in technical systems, rather than deliberative processes that involve educators and community members, ed tech platforms subtly shift educational authority from public institutions to private companies. This represents another transparency issue—not just about what data means, or how it aligns to standards, but whose vision of education is being realized in classrooms.[118] If schools clarify their own vision before seeking ed tech platforms, they can "shop smart" by evaluating whether potential platforms support rather than undermine their goals.

Governance and Autonomy

As the previous section illustrates, ed tech platforms create vulnerabilities for schools by binding them to decisions made by private companies and facilitated by technical processes that are unaccountable to educational institutions or the publics they serve. This arrangement has significant implications for school governance and autonomy.

The multi-sided market structure of ed tech platforms ensures that the instructional needs of administrators and teachers are always moderated by the commercial needs of platform providers themselves.[119] This creates a troubling power asymmetry, where schools are perpetually subject to the whims of the platform companies on which they rely.[120] In 2023, for instance, when Google changed its storage limits and began charging for previously free resources, many higher education institutions scrambled for funds and data storage to maintain critical services, such as university email systems.[121] While many K–12 districts were unaffected by this particular change, it nevertheless illustrates the precarious position of platform-dependent schools.[122] If, tomorrow, Google decided that Workspace for Education no longer aligned with its strategic priorities, and it chose to discontinue the program as it has for previous popular services,[123] very few U.S. districts would not be impacted. Such scenarios highlight how the proliferation of platforms in schools can encroach on the autonomy of public education as an institution.

Governance challenges like these call for robust policy guardrails and regulatory frameworks to assure transparency, vetting, and regular auditing of platforms used in schools. Without them, administration and instruction become increasingly vulnerable to unilateral decisions by private platform providers whose primary accountability is not to schools or students, but to investors. Several approaches have proved promising in this regard. In the U.S., some districts have developed technology policies to strengthen their negotiating positions with providers.[124] National school systems (e.g., the Netherlands) have used legal

pressure to limit the influence of platform providers such as Google in their schools.[125] These examples demonstrate that, while not without difficulties, reclaiming educational autonomy is possible through concerted policy action.

Surveillance and Privacy

Like their pedagogical and data-analytical practices, platform providers' privacy practices are also hard to pin down. This is because the legal documents that govern these practices omit important information, contain vague or misleading language, and sometimes contain so much information that it becomes difficult, if not impossible, to know what companies' policies actually are. Of our three sample platforms, Zearn has the simplest documentation: It posts a privacy policy and terms of service on its website, and provides a Data Protection Addendum (DPA) when districts contract for its services.[126] Kahoot! has a "Trust Center" on its website that lists 21 documents, including a "privacy notice" and a Data Processing Agreement.[127] Google provides no clear listing of documents containing privacy-relevant policies and no simple way to find them (see Appendix).[128] Many of Google's documents are undated, obscuring updates. Parents and teachers likely do not understand the complexities of how Google handles children's data. The Cheyenne Mountain School District (Colorado Springs, CO) Google FAQs page, for example, simply reassures readers that Google and the district comply with federal privacy law and that ads are turned off.[129]

None of our sample platforms present paid ads to child users. However, their data use, retention, and deletion practices are unclear. Partly, this is because their privacy policies, consistent with federal and state law, reserve protections for "personally identifiable" data.[130] They contain provisions that allow providers to "de-identify" the data and continue using it in its de-identified form.[131] Because de-identified data can be easily re-identified,[132] privacy policies also promise to not re-identify it. Without oversight, however, these are only promises—particularly as data changes hands between subcontractors, partner companies, and others.[133] And despite claims that student data will be used only for the purposes for which it is collected, de-identification provides a legal means for it to be used in perpetuity for unspecified commercial purposes including product development and marketing.[134] Indeed, one of the most valuable uses of such data for platform providers, highly promoted by investors, is incorporating it into the development of new features that can be marketed back to schools to reinforce their competitive advantage. In 2020, for instance, Zearn expanded its curriculum offerings to include an intervention program.[135] It is also unclear, now in the age of artificial intelligence (AI), whether student data is used to train AI models such as Google's Gemini.

Upon careful reading, the retention periods and deletion practices described in privacy policies are often vague. For example, Kahoot! "retain[s] Personal Information where we have an ongoing legitimate business or legal obligation to do so"[136]—suggesting no clear end date. Its Privacy Notice says it will either "permanently delete or destroy the relevant Personal Information; or anonymize the relevant Personal Information."[137] It does not specify how the company determines which to do, or what "permanently delete" or "destroy" actually means.[138] Zearn's Data Protection Addendum promises that the organization "securely deletes" data upon schools' request and requires its subcontractors to do the same.[139] However,

it defines secure deletion as anonymization (not "deletion" as most people understand the term).[140]

In theory, districts negotiate contracts with ed tech providers, and providers collect and process student data as designated "school officials" under direct control of schools.[141] In practice, schools and districts typically lack the personnel, expertise, and power to clarify every contract clause and negotiate effectively with providers. They cannot legally examine, much less control, the programming of ed tech platforms that process student data. In many cases, they may adopt platforms via "click-through" agreements without any negotiation. As a matter of practice, Google dictates terms and conditions to districts. Denmark's negotiations to force Google to comply with European law were an exception—noteworthy because compliance with the law should be a basic requirement for doing business, but also because a national agency had to intervene when an individual municipality could not enforce compliance And even so, the outcome was negotiated rather than determined by the national agency. Smaller providers such as Kahoot! and Zearn may be more likely to negotiate with districts that demand concessions and specifics (such as data retention periods and deletion practices) in their contracts.[142] Smaller and poorer districts may have less power to negotiate than larger or wealthier districts.

Many districts rely on privacy policies offered by providers, and on providers' signatures on the Student Privacy Pledge. These are insufficient without oversight and accountability. Google, in particular, has been repeatedly accused of violating students' privacy by extracting their data and using it without consent for undisclosed commercial purposes.[143] Individuals may file complaints with the U.S. Department of Education (USDOE) for violations of the Family Educational Rights and Privacy Act (FERPA) or with the Federal Trade Commission (FTC) for violations of the Student Privacy Pledge. However, the USDOE has not acted on complaints about privacy violations.[144] The Student Privacy Pledge, which also had not been enforced, was archived in 2025.[145] Similarly, state laws provide little oversight of providers' compliance and contain multiple loopholes that prevent them from adequately protecting student data. Districts can band together in consortia to increase their negotiating power with providers.[146] Even more helpful would be robust state policy that supports districts by closing loopholes and providing oversight to ensure transparency and compliance from providers.

Policy to Support Schools' Missions

Given the challenges associated with digital platforms, schools and districts would best serve their communities by limiting ed tech adoption and establishing rigorous review procedures. This requires a proactive process for schools to clearly articulate their own needs, values, and goals, and to determine whether these are supported or undermined by digital platforms—or whether they might be best achieved through nondigital means.[147,148] This approach can buffer decision-makers from relentless marketing and enable them to adopt only those platforms that support their self-determined aims.

Furthermore, school leaders need higher-level policy support as a backstop against the negative consequences of ed tech. Federal policy, in particular, currently promotes artificial in-

telligence (AI) as a means of modernizing education and creating a 21st-century workforce, and encourages states to follow suit. AI, however, amplifies the concerns identified in this brief, and schools may well want to limit their engagement with it.[149] More generally, higher-level guidance, oversight, and regulation could strengthen decision-making by teachers, principals, and district administrators. Shared policy templates and guidelines could support educators in developing local policies without each school needing to do so from scratch. If states took responsibility for verifying and approving the quality of platforms approved for school use, they would free districts of the expense and effort required to vet platforms and negotiate with providers, reduce inequities among districts, and leverage the power of the state to ensure the quality and safety of the platforms used by their students.

VI. Recommendations

To enable schools to make the best choices for themselves regarding digital educational platforms, we recommend that:

Teachers and Educational Leaders:

- Limit educational screen time, particularly for young students.
- Clearly articulate the pedagogical values, goals, and practices they seek to achieve.
- Use these criteria as a standard by which to evaluate any digital platform considered for adoption.

State Policymakers:

- Establish an independent government entity charged with ensuring the quality of all digital educational platforms to be used in schools, including platforms incorporating artificial intelligence (AI).
- Charge this entity with reviewing and approving the pedagogy and programming of platforms, before their implementation and periodically thereafter.
- Require that platforms' programming be transparent and amenable to review.
- Create standardized contract templates that include mandatory clauses to protect student data, including by establishing mandatory deletion timelines, requiring plain-language privacy policies and regular third-party audits of data practices, prohibiting unilateral changes to terms of service mid-contract, and guaranteeing data portability when services are discontinued or districts change providers.
- Adopt regulations prohibiting schools from using any technology, including AI models, whose workings are not transparent to state regulators, unless they provide a well-developed rationale for why this technology is the only way to achieve a clearly defined and valid school purpose.

Federal and State Policymakers:

- Stop uncritically promoting AI, which amplifies threats associated with digital educational platforms, as a way to transform and modernize schools' pedagogical and administrative practices.

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Brass, J. & Lynch, T.L. (2020). Personalized learning: A history of the present. *Journal of Curriculum Theorizing, 35*(2), 3-21. Retrieved May 5, 2025, from https://doi.org/10.63997/jct.v35i2.807

Watters, A. (2021). *Teaching machines: The history of personalized learning*. Cambridge, MA: MIT Press.

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See:

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Cone, L. (2023). Subscribing school: Digital platforms, affective attachments, and cruel optimism in a Danish public primary school. *Critical Studies in Education, 65*(3), 294-311. Retrieved April 23, 2025, from https://doi.org/10.1080/17508487.2023.2269425

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Organisation for Economic Co-operation and Development (OECD). (2015). Students, computers, and learning: Making the connection (p. 15). Retrieved April 22, 2025, from https://www.oecd.org/en/publications/students-computers-and-learning_9789264239555-en.html

40 In 2023, the OECD reported that students who said they spent an hour or less daily on digital devices in school (either for learning or pleasure) scored higher on the Programme for International Student Assessment (PISA) in math than students who spent no time on devices in school. This advantage disappeared as students spent more hours in the day on digital devices in school. If the time spent on devices was recreational rather than learning-focused, performance plummeted.

Organisation for Economic Co-operation and Development (OECD). (2023). PISA 2022 results (volume II: Learning during – and from – disruption (p. 194). Retrieved April 22, 2025, from https://www.oecd.org/en/publications/pisa-2022-results-volume-ii_a97db61c-en.html

41 United Nations Educational, Scientific and Cultural Organization (UNESCO) (2023). *2023 Global education monitoring report: Technology in education: A tool on whose terms?* Retrieved July 17, 2025, from https://unesdoc.unesco.org/ark:/48223/pf0000385723

42 Herold, B. (2017, November 7). 6 Key Insights: RAND Corp. researchers talk personalized learning. *Education Week*. Retrieved May 13, 2025, from https://www.edweek.org/leadership/6-key-insights-rand-corp-researchers-talk-personalized-learning/2017/11

43 Pane, J.F., Steiner, E.D., Baird, M.D., & Hamilton, L.S. (2015). *Continued progress: Promising evidence on personalized learning*. Santa Monica, CA: RAND Corporation. Retrieved June 3, 2020, from https://www.rand.org/pubs/research_reports/RR1365.html

Pane, J.F., Steiner, E.D., Baird, M.D., Hamilton, L.S., & Pane, J.D. (2017). *Informing progress: Insights on personalized learning implementation and effects*. Santa Monica, CA: RAND Corporation. Retrieved June 3, 2020, from https://www.rand.org/content/dam/rand/pubs/research_reports/RR2000/RR2042/RAND_RR2042.pdf

Pane, J.F. (2018). *Strategies for implementing personalized learning while evidence and resources are*

*underdeveloped (*p. 4). Santa Monica, CA: RAND Corporation, 2018. Retrieved June 3, 2020, from https://www.rand.org/pubs/perspectives/PE314.html

Penuel and Johnson's 2016 review of RAND's 2015 report concludes, "The research, which includes many high-quality elements, suggests that some of the studied approaches are associated with higher scores on a common assessment (the MAP). Broad conclusions about the efficacy of technology-based personalized learning, however, are not warranted by the research. Limitations include a sample of treatment schools that is unrepresentative of the general population of schools, the lack of a threshold in the study for what qualified as implementing "personalized learning" in the treatment schools, and the reality that disruptive strategies such as competency-based progression, which require the largest departures from current practice, were rarely implemented in the studied schools."

Penuel, W.R. & Johnson, R. (2016). *NEPC Review: Continued progress: Promising evidence on personalized learning*. Boulder, CO: National Education Policy Center. Retrieved June 3, 2020, from https://nepc.colorado.edu/thinktank/review-personalized-learning

44 Amrein-Beardsley, A. (2022). *NEPC Review: Pathways to success: Exploring the long-term outcomes of alumni from Summit Public Schools*. Boulder, CO: National Education Policy Center. Retrieved April 18, 2025, from https://nepc.colorado.edu/thinktank/summit

Molnar, A., Boninger, F., Noble, A., & Mani, M. (2023). *We need better education policy. Summit Public Schools shows why*. Boulder, CO: National Education Policy Center. Retrieved April 8, 2025, from http://nepc.colorado.edu/publication/summit-2023

45 Ready, D.D., Conn, K., Bretas, S.S., & Daruwala, I. (2019, January). *Final impact results from the i3 implementation of Teach to One: Math*. Consortium for Policy Research in Education. Retrieved June 3, 2020, from https://www.newclassrooms.org/wp-content/uploads/2019/02/Final-Impact-Results-i3-TtO.pdf

46 UNESCO's 2023 report notes that most of the "evidence" supporting the use of ed tech comes from the companies that provide it, and that the findings tend to be unreliable.

United Nations Educational, Scientific and Cultural Organization (UNESCO) (2023). *2023 Global education monitoring report: Technology in education: A tool on whose terms?* Retrieved June 17, 2025, from https://unesdoc.unesco.org/ark:/48223/pf0000385723

Research on the efficacy of ed tech platforms is an example of what DeBray and colleagues have called "supply side" evidence, where intermediaries (e.g., think tanks, foundations, industry actors) furnish research directly to districts and schools to influence policy or encourage procurement of products and services.

See:

DeBray, E., Scott, J., Lubienski, C., Jabbar, H. (2014). Intermediary organizations in chart school policy coalitions: Evidence from New Orleans. *Educational Policy, 28*(2), 175-206.

The spread of supply-side evidence in the ed tech sector has led to the creation of 'evidence brokering' entities for assisting educational institutions in evaluating the quality of industry research.

See:

Williamson, B. (2021). Meta-edtech. *Learning, Media, and Technology, 46*(1), 1-5.

47 For example, researchers who studied the math program Prodigy were sanguine about recommending the program, but also reported that "a student would need to complete roughly 888 questions in order to achieve a one-point gain in their standardized assessment score" (an awful lot of questions for a single-point gain), and also that "students in the high-usage group did not perform significantly better than students in the mid-usage group."

Morrison, J., Risman, K., Reilly, J. & Eisinger, J. (2020, January 1). An evaluation of Prodigy: A case-study approach to implementation and student achievement outcomes. (p. 26). Johns Hopkins University: Center for Research and Reform in Education. Retrieved April 18, 2025, from http://jhir.library.jhu.edu/handle/1774.2/62841

48 Anagnostopoulos, D., Rutledge, S.A., & Jacobsen, R. (2013). *The infrastructure of accountability: Data use and the transformation of American education*. Cambridge, MA: Harvard Education Press.

Dixon-Román, E. (2017). *Inheriting possibility: Social reproduction and quantification in education*. Minneapolis, MN: University of Minnesota Press.

Gulson, K.N., Sellar, S., & Webb, P.T. (2022). *Algorithms of education: How datafication and artificial intelligence shape policy*. Minneapolis, MN: University of Minnesota Press.

49 Brass, J. & Lynch, T.L. (2020). Personalized learning: A history of the present. *Journal of Curriculum Theorizing, 35*(2), 3-21. Retrieved May 5, 2025, from https://journal.jctonline.org/index.php/jct/article/view/807

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Meyer, D. (2025, April 9). *The AI rapture ain't nigh: What to do when you stop waiting* [video]. YouTube. Retrieved April 10, 2025, from https://www.youtube.com/watch?v=pUb9RBZv7Po

50 Kormos, E.M. (2018). The unseen digital divide: Urban, suburban, and rural teacher use and perceptions of web-based classroom technologies. *Computers in the Schools, 35*(1), 19-31. Retrieved May 12, 2025, from https://doi.org/10.1080/07380569.2018.1429168

Heinrich, C.J., Darling-Aduana, J., Good, A., & Cheng, H. (2019). A look inside online educational settings in high school: Promise and pitfalls for improving educational opportunities and outcomes. *American Educational Research Journal, 56*(6), 2147-2188. Retrieved May 12, 2025, from https://doi.org/10.3102/0002831219838776

West, M. (2023). *An ed-tech tragedy? Educational technologies and school closures in the time of COVID-19* (pp. 181-183). United Nations Educational, Scientific and Cultural Organization (UNESCO). Retrieved July 17, 2025, from https://unesdoc.unesco.org/ark:/48223/pf0000386701/PDF/386701eng.pdf.multi

51 Crossland, A., Gray, T., & Reynolds, J. (2018). *ESSA and digital learning: Closing the digital accessibility gap*. Washington, D.C.: American Institutes for Research. Retrieved May 12, 2025, from https://www.air.org/sites/default/files/downloads/report/ESSA-Digital-Lrng-508.pdf

Saul, S. (2022, January 25). Put down your no. 2 pencil. Forever. *New York Times*. Retrieved May 12, 2025, from https://www.nytimes.com/2022/01/25/us/sat-test-digital.html Najarro, I. (2024, July 25). Why most AP exams are going digital this May. *Education Week*. Retrieved May 12, 2025, from http://edweek.org/teaching-learning/why-most-ap-exams-are-going-digital-this-may/2024/07

52 U.S. Department of Education, Office of Educational Technology. (2017). *Reimagining the role of technology in education: 2017 national education technology plan update* (p. 81). Washington, D.C.: U.S. Department of Education. Retrieved May 12, 2025, from https://www.oerknowledgecloud.org/record1928

U.S. Department of Education, Office of Educational Technology. (2024). *A call to action for closing the digital access, design, and use divides: 2024 national educational technology plan* (p. 58). Washington, D.C.: U.S. Department of Education. Retrieved July 11, 2025, from https://oercommons.s3.amazonaws.com/media/

courseware/relatedresource/file/NationalEducationTechnologyPlan2024_ZWP41ol.pdf

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Kerssens, N., Nichols, T.P., & Pangrazio, L. (2024). Googlization(s) of education: Intermediary work brokering platform dependence in three national school systems. *Learning, Media, & Technology, 49*(3), 478-491. Retrieved May 12, 2025, from https://doi.org/10.1080/17439884.2023.2258339

54 Cloud Information Center (n.d.). Software as a Service (Saas) [webpage]. Retrieved April 14, 2025, from https://cic.gsa.gov/solutions/saas

55 For example, if a vendor realizes that inadequate color contrast on a page is preventing students with limited vision from comfortably using the platform, it can update the colors. If the vendor determines that integrating a generative artificial intelligence feature into a product can make it more effective, efficient, or profitable, it can add that feature.

For examples, see:

Google (2024, November 8). Expanding access to the Gemini app for teen students in education. *Google Workspace Updates* [blogpost]. Retrieved May 21, 2025, from https://workspaceupdates.googleblog.com/2024/10/gemini-app-access-for-teen-students-workspace-education.html

Gradient Learning (n.d.). Major updates coming to Summit Learning [webpage]. Retrieved May 21, 2025, from https://gradientlearning.org/whole-student-journal/major-updates-coming-to-summit-learning/

Summit Learning (2022, August). Platform updates.Retrieved August 29, 2022, from https://help.summitlearning.org/hc/en-us/articles/360001538487-Platform-Updates

56 Sadowski, J. (2020). The Internet of landlords: Digital platforms and new mechanisms of rentier capitalism. *Antipode, 52*(2), 562-580. Retrieved April 14, 2025, from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3544976

Williamson, B. (2022, July 21). Enclouding education [blog post]. *Code Acts in Education*. Retrieved April 14, 2025, from https://codeactsineducation.wordpress.com/2022/07/21/enclouding-education/

57 For example, Kahoot!'s Terms and Conditions specify that: " We reserve the right to change these Terms from time to time. Changes may for example be made to accommodate new products or services, to adapt to legal requirements, or otherwise to better adapt the Terms to our business. If there is a material change to these Terms, we will notify you either by email to your registered email account, in-App or in-Service notifications or on our official Websites (as appropriate). It is your responsibility to read any such notice carefully. Your continued use of the Services after such changes will constitute acknowledgment and agreement of the modified Terms. If you do not wish to continue using the Service under the new version of the Terms, you may cancel your Service Plan or terminate the Agreement."

Kahoot! (2025, February 10). Kahoot! terms and conditions. Retrieved February 27, 2025, from https://trust.kahoot.com/terms-and-conditions/

58 Komljenovic, J. (2021). The rise of education rentiers: Digital platforms, digital data, and rents. *Learning, Media, & Technology, 46*(3), 320-332. Retrieved May 12, 2025, from https://doi.org/10.1080/17439884.2021.1891422

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Nichols, T.P. & Thrall, A. (2025). Platform privatization: Data, technology, and the changing infrastructure of educational governance. In A. Zancajo, C. Fontadevila, H. Jabbar, & A. Verger (Eds.), *Research handbook on education privatization and marketization* (pp. 108-121). Cheltenham, UK: Edward Elgar. Retrieved May 12, 2025, from https://doi.org/10.4337/9781035311385.00014

Burch, P. (2021). *Hidden markets: Public policy and the push to privatize education* (2nd ed.). New York, NY: Routledge.

60 Molnar, A., Boninger, F., Noble, A., & Mani, M. (2023). *We need better education policy. Summit Public Schools shows why*. Boulder, CO: National Education Policy Center. Retrieved April 8, 2025, from http://nepc.colorado.edu/publication/summit-2023

61 Even the most comprehensive state privacy laws, such as those enacted in Connecticut, Colorado, and California, contain specific exclusions for data collected for "personalized learning" purposes.

"An Act Concerning Student Data Privacy," Connecticut Public Act No. 16-189.

"Student Data Transparency and Security Act," C.R.S.22-16-101 et seq.

"Student Online Personal Information Protection Act," Cal Bus & Prof Code, §§ 22584-22585 (2015)

See:

Boninger, F. & Molnar, A. (2016). *Learning to be watched: Surveillance culture at school—The eighteenth annual report on schoolhouse commercializing trends, 2014-2015*. Boulder, CO: National Education Policy Center. Retrieved December 14, 2016, from http://nepc.colorado.edu/publication/schoolhouse-commercialism-2015

62 State and federal law, and ed tech privacy policies, carefully distinguish between "personally identifiable information" and other data collected from student and teacher users. The common sense implication of this distinction is that "personally identifiable" or "personal" information is worthy of protection, while other data is not.

Privacy Technical Assistance Center (2014, February). Protecting student privacy while using online educational services: Requirements and best practices (PTAC-FAQ-3). Retrieved June 11, 2025, from https://studentprivacy.ed.gov/sites/default/files/resource_document/file/Student%20Privacy%20and%20Online%20Educational%20Services%20%28February%202014%29_0.pdf

63 Narayanan, A. & Kapoor, S. (2024) *AI snake oil: What artificial intelligence can do, what it can't, and how to tell the difference*. Princeton University Press.

O'Neil, C. (2016). *Weapons of math destruction: How big data increases inequality and threatens democracy*. New York, NY: Crown.

Osoba, O.A. & Welser, W. (2017). *An intelligence in our image: The risks of bias and errors in artificial intelligence*. Santa Monica, CA: RAND Corporation. Retrieved September 4, 2025, from https://www.rand.org/pubs/research_reports/RR1744.html

Pasquale, F. (2015). *The black box society: The secret algorithms that control money and information*. Cambridge, MA: Harvard University Press.

64 Feathers, T. (2021, April 8). Proctorio is using racist algorithms to detect faces. *Vice*. Retrieved May 27, 2025, from https://www.vice.com/en/article/proctorio-is-using-racist-algorithms-to-detect-faces/

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66 Marshall, J. (2023, July 5). As AI cheating booms, so does the industry detecting it: 'We couldn't keep up with demand.' *The Guardian*. Retrieved September 4, 2025, from https://www.theguardian.com/technology/2023/jul/05/as-ai-cheating-booms-so-does-the-industry-detecting-it-we-couldnt-keep-up-with-demand

67 Fowler, G.A. (2023, August 14). What to do when you're accused of AI cheating. *The Washington Post*. Retrieved September 4, 2025, from https://www.washingtonpost.com/technology/2023/08/14/prove-false-positive-ai-detection-turnitin-gptzero/

68 Mathewson, T.G. (2023, August 14). AI detection tools falsely accuse international students of cheating. *The Markup*. Retrieved September 5, 2025, from https://themarkup.org/machine-learning/2023/08/14/ai-detection-tools-falsely-accuse-international-students-of-cheating

69 Feathers, T. (2019, August 20). Flawed algorithms are grading millions of students' essays. *Vice*. Retrieved September 18, 2025, from https://www.vice.com/en/article/pa7dj9/flawed-algorithms-are-grading-millions-of-students-essays

70 For the "mini-report" focused on individualized education plans (IEPs), see:

Tech Impact Lab (2025). *Schools using AI large language models to meet special needs of students: What could possibly go wrong?* Georgetown University. Retrieved September 3, 2025, from https://www.law.georgetown.edu/tech-institute/wp-content/uploads/sites/42/2025/08/IEP-Mini-Report.pdf.pdf

For the complete report, see:

Tech Impact Lab (2025). *From chalkboards to algorithms: EdTech readiness for the Colorado AI Act*. Georgetown University. Retrieved September 3, 2025, from https://www.law.georgetown.edu/tech-institute/wp-content/uploads/sites/42/2025/08/AI-in-Colorado-EdTech-Full-Report.pdf

71 American Academy of Pediatrics (2021). *Beyond screen time: A parent's guide to media use* [subscription required].

American Psychological Association. (2019, December 12). *Digital guidelines: Promoting healthy technology use for children*. Retrieved May 27, 2025, from https://www.apa.org/topics/social-media-internet/technology-use-children

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Chassiakos, Y.R., Radesky, J., Christakis, D., Moreno, M.A., Cross, C., & Council on Communications and Media. (2016). Children and adolescents and digital media. *Pediatrics*, *138*(5), e20162593. Retrieved May 27, 2025, from https://doi.org/10.1542/peds.2016-2593

72 An exception is the American Psychological Association's June 2025 "health advisory" on AI and adolescent well-being. This paper references educators' roles primarily in the context of teaching adolescents AI literacy, including critical evaluation of the output of AI systems. The paper notes that AI is increasingly being used to automate decision-making, including in education, and recommends that builders of AI systems incorporate transparency, "bias detection and mitigation tools," and reporting mechanisms into AI platforms (p. 8).

American Psychological Association (2025, June). *Artificial intelligence and adolescent well-being: An APA health advisory*. Retrieved June 12, 2025, from https://www.apa.org/topics/artificial-intelligence-machine-learning/health-advisory-ai-adolescent-well-being

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Jargon, J. (2022, March 19). YouTube is a huge classroom distraction. Teachers are reluctant to banish it. *Wall Street Journal*. Retrieved May 12, 2025, from https://www.wsj.com/us-news/education/youtube-is-a-huge-classroom-distraction-teachers-are-reluctant-to-banish-it-11647656643

Wooden, J.A. (2025, July 15). "OK Google, make middle school suck even more!" *Epostasy*. Retrieved July 15, 2025, from https://johnallenwooden.substack.com/p/ok-google-make-middle-school-suck?r=3833nx&utm_medium=ios&triedRedirect=true

74 YouTube is consistently ranked among the Top 40 platforms accessed by districts and schools, and it is the #1 most accessed in the 'Sites & Resources' category according to Instructure's *Edtech Top 40* report: https://www.instructure.com/edtech-top40

75 Center for Countering Digital Hate (2024, November). *YouTube's anorexia algorithm: How YouTube recommends eating disorders videos to young girls*. Retrieved April 8, 2025, from https://counterhate.com/research/youtube-anorexia-algorithm/

Nagata, J.M., Al-Shoaibi, A.A., Leong, A.W., et al. (2024). Screen time and mental health: A prospective analysis of the Adolescent Brain Cognitive Development (ABCD) Study. *BMC Public Health, 24*, 2686. Retrieved April 8, 2024, from https://doi.org/10.1186/s12889-024-20102-x

And worse, there has been a plethora of horrific AI-generated content targeted at children on YouTube.

Holiday, L. (2025, May 2). Dozens of YouTube channels are showing AI-generated cartoon gore and fetish content. *WIRED*. Retrieved May 27, 2025, from https://www.wired.com/story/dozens-of-youtube-channels-are-showing-ai-generated-cartoon-gore-and-fetish-content/

76 Hansraj, K. (2014, November). Assessment of stresses in the cervical spine caused by posture and position of the head. *Surgical Technology Online 25*, 277-9. Retrieved June 11, 2025, from https://esq.h-cdn.co/assets/cm/15/07/54d948b56d7d7_-_spine-study.pdf

Kuehn, B.M. (2021, September 21). Increase in myopia reported among children during COVID-19 lockdown. *JAMA, 326*(11). Retrieved June 11, 2025, from https://jamanetwork.com/journals/jama/fullarticle/2784348

Straker, L., Maslen, B., Burgess-Limerick, R., Johnson, P., & Dennerlein, J. (2010). Evidence-based guidelines for the wise use of computers by children: Physical development guidelines. *Ergonomics*, *53*(4), 458–477. Retrieved June 11, 2025, from https://www.tandfonline.com/doi/full/10.1080/00140130903556344

West, M. (2023). *An ed-tech tragedy? Educational technologies and school closures in the time of COVID-19* (pp. 190-191). United Nations Educational, Scientific and Cultural Organization (UNESCO). Retrieved July 17, 2025, from https://unesdoc.unesco.org/ark:/48223/pf0000386701/PDF/386701eng.pdf.multi

77 For example:

Oregon Department of Education (2021, March 19). *Comprehensive distance learning*. Retrieved May 21, 2025, from https://www.oregon.gov/ode/students-and-family/healthsafety/Documents/Comprehensive%20Distance%20Learning%20Guidance.pdf

78 Governor Andrew Cuomo of New York told his state that, "One of the areas we can really learn from is education because the old model of our education system where everyone sits in a classroom is not going to work in the new normal. When we do reopen our schools let's reimagine them for the future, and to do that we are collaborating with the Bill & Melinda Gates Foundation and exploring smart, innovative education alternatives using all the new technology we have at our disposal."

New York State Governor's Office (2020, May 5). Amid ongoing COVID-19 pandemic, Governor Cuomo announces collaboration with Gates Foundation to develop a blueprint to reimagine education in the new normal. Retrieved April 23, 2025, from https://www.governor.ny.gov/news/amid-ongoing-covid-19-pandemic-governor-cuomo-announces-collaboration-gates-foundation-develop

See also:

Williamson, B. & Hogan, A. (2020). *Commercialisation and privatisation in/of education in the context of COVID-19*. Education International. Retrieved April 11, 2025, from https://www.ei-ie.org/en/item/23423:the-edtech-pandemic-shock-by-ben-williamson-anna-hogan

79 Google and Microsoft partnered with international organizations such as UNESCO to provide the software, hardware, and technical infrastructure needed to supply students with remote digital learning. Google accommodated wildly increased demand for Google Classroom and created a "Teach from Home" hub, and Microsoft helped schools upgrade to its Office365.

Shah, A. (2020, March 20). Helping educators and students stay connected [blogpost]. *Google: The Keyword*. Retrieved April 23, 2025, from https://blog.google/outreach-initiatives/education/helping-educators-and-students-stay-connected/

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80 Shah, A. (2020, March 20). Helping educators and students stay connected [blogpost]. *Google: The Keyword*. Retrieved April 23, 2025, from https://blog.google/outreach-initiatives/education/helping-educators-and-students-stay-connected/

81 Williamson, B. & Hogan, A. (2020). *Commercialisation and privatisation in/of education in the context of COVID-19*. Education International. Retrieved April 11, 2025, from https://www.ei-ie.org/en/item/23423:the-edtech-pandemic-shock-by-ben-williamson-anna-hogan

82 HolonIQ (2024). *2024 Global EdTech 1000*. Retrieved April 24, 2025, from https://www.holoniq.com/notes/2024-global-edtech-1000

83 The districts studied use LearnPlatform's browser extension, and average at least 50 educator and1000 student users per month during the school year.

LearnPlatform (2024, July). *EdTech top 40*. Retrieved July 22, 2024, from https://www.instructure.com/resources/research-reports/edtech-top-40-look-k-12-edtech-engagement-during-2023-24-school-year

See also:

Ng, A. (2023, June 26). Districts using more tech tools overall, but individual educators taking up fewer, report finds. *Education Week*. Retrieved May 23, 2025, from https://marketbrief.edweek.org/education-market/districts-using-more-tech-tools-overall-but-individual-educators-taking-up-fewer-report-finds/2023/06

84 Williamson, B., Molnar, A., & Boninger, F. (2024). *Time for a pause: Without effective public oversight, AI in schools will do more harm than good*. Boulder, CO: National Education Policy Center. Retrieved April 11, 2025, from http://nepc.colorado.edu/publication/ai

85 For example, Google has integrated Gemini into its core services for many of its "Workspaces," including for education. ChatGPT, developed by OpenAI, is integrated into Khanmigo, and Copilot, developed by a subsidiary of Microsoft (GitHub), is integrated into Microsoft 365.

Google (2024, November 8). Expanding access to the Gemini app for teen students in education. *Google Workspace Updates*. Retrieved May 28, 2025, from https://workspaceupdates.googleblog.com/2024/10/gemini-app-access-for-teen-students-workspace-education.html

Khan, S. (2023, March 14). *Harnessing GPT-4 so that all students benefit. A nonprofit approach for equal access*. Khan Academy. Retrieved November 23, 2023, from https://blog.khanacademy.org/harnessing-ai-so-

that-all-students-benefit-a-nonprofit-approach-for-equal-access/

Microsoft Education Team (2024, January 23). Meet your AI assistant for education: Microsoft Copilot [blog post]. Retrieved May 28, 2025, from https://www.microsoft.com/en-us/education/blog/2024/01/meet-your-ai-assistant-for-education-microsoft-copilot/

For discussion of Khanmigo and ChatGPT, see:

Williamson, B., Molnar, A., & Boninger, F. (2024). *Time for a pause: Without effective public oversight, AI in schools will do more harm than good*. Boulder, CO: National Education Policy Center. Retrieved April 11, 2025, from http://nepc.colorado.edu/publication/ai

86 American Federation of Teachers (2025, July 8). *AFT to launch National Academy for AI Instruction with Microsoft, OpenAI, Anthropic and United Federation of Teachers* [press release]. Retrieved July 25, 2025, from https://www.aft.org/press-release/aft-launch-national-academy-ai-instruction-microsoft-openai-anthropic-and-united

87 Kaufman, J.H., Woo, A., Eagan, J., Lee, S., & Kassan, E.B. (2025, February 11). RAND Corporation. Retrieved April 25, 2025, from https://www.rand.org/pubs/research_reports/RRA134-25.html

88 The nature of the training was undefined, but follow-up interviews with a subset of respondents suggested that these trainings were often opt-in, one-off, and intended to allay teachers' fears about AI.

Diliberti, M.K., Lake, R.J., & Weiner, S.R. (2025, April). *More districts are training teachers on artificial intelligence: Findings from the American School District Panel*. RAND. Retrieved July 17, 2025, from https://www.rand.org/pubs/research_reports/RRA956-31.html

89 Dussealt, B. & Lee, J. (2023, October). *AI is already disrupting education, but only 13 states are offering guidance for schools*. CRPE. Retrieved April 24, 2025, from https://crpe.org/ai-disrupt-ed-13-states

90 McCann, J. (2025, June 17). *How states are responding to the rise of AI in education*. Education Commission of the States. Retrieved July 17, 2025, from https://www.ecs.org/artificial-intelligence-ai-education-task-forces/

91 For example:

Wall, P. (2025, August 21). *Louisiana leans into AI in schools. Is it worth all the hype?* Nola.com. Retrieved August 21, 2025, from https://www.nola.com/news/education/louisiana-ai-schools-bese-resolution/article_191f37e7-017d-4f46-ba9c-1be18459b335.html

92 The White House (2025, April 23). *Advancing artificial intelligence education for American youth*. Retrieved April 28, 2025, from https://www.whitehouse.gov/presidential-actions/2025/04/advancing-artificial-intelligence-education-for-american-youth/

93 President Biden's October 2023 executive order mandated the U.S. Department of Education to create an "AI toolkit" to "shape AI's potential to transform education by creating resources to support educators deploying AI-enabled educational tools, such as personalized tutoring in schools."

President Trump rescinded the Biden Executive Order on January 21, 2025, his first day in office, and replaced it with his own on April 23, 2025.

O'Brien, M. (2025, January 22). Trump rescinds Biden's executive order on AI safety in attempt to diverge from his predecessor. *Associated Press*. Retrieved May 13, 2025, from https://apnews.com/article/trump-ai-repeal-biden-executive-order-artificial-intelligence-18cb6e4ffd1ca87151d48c3a0e1ad7c1

The White House (2023, October 30). *FACT SHEET: President Biden issues executive order on safe, secure, and trustworthy artificial intelligence.* Retrieved October 31, 2023, from https://www.whitehouse.gov/briefing-room/statements-releases/2023/10/30/fact-sheet-president-biden-issues-executive-order-on-safe-

secure-and-trustworthy-artificial-intelligence/

The White House (2025, April 23). *Advancing artificial intelligence education for American youth*. Retrieved April 28, 2025, from https://www.whitehouse.gov/presidential-actions/2025/04/advancing-artificial-intelligence-education-for-american-youth/

94 Congressional budget legislation under consideration in June 2025 originally contained language prohibiting subordinate jurisdictions from "enforce[ing] any law or regulation regulating artificial intelligence models, artificial intelligence systems, or automated decision systems" for 10 years. This language was removed in the final hours of the Senate voting process.

Hudson, V. (2025, May 27). Perspective: The Trojan horse inside the big, beautiful bill. *Deseret News*. Retrieved May 30, 2025, from https://www.deseret.com/opinion/2025/05/27/big-beautiful-bill-ai-state-laws-congress/

Oremus, W. (2025, July 1). How tech's bold bid to curb AI laws fell apart. *Washington Post*. Retrieved July 8, 2025, from https://www.washingtonpost.com/technology/2025/07/01/ai-moratorium-defeat-senate-silicon-valley/

95 White House Office of Science and Technology Policy (2025). *Pledge to America's Youth: Investing in AI Education*. Retrieved July 25, 2025, from https://www.whitehouse.gov/edai/

The short text of the pledge reads:

"_____ pledges to provide resources that foster early interest in AI technology, promote AI literacy and proficiency, and enable comprehensive AI training for educators.

We pledge to invest in America's K-12 students and teachers by providing resources that cultivate the skills and knowledge necessary for an AI-ready workforce and the next generation of American innovators.

Specifically, over the next 4 years, we pledge to make available resources for youth and teachers through funding and grants, educational materials and curricula, technology and tools, teacher professional development programs, workforce development resources, and/or technical expertise and mentorship."

96 Nichols, T.P. (2022). *Building the Innovation School: Infrastructures for equity in today's classrooms*. Teachers College Press.

For an explicit example of how this imperative acts on schools, see President Trump's April 2025 executive order:

The White House (2025, April 23). *Advancing artificial intelligence education for American youth*. Retrieved April 28, 2025, from https://www.whitehouse.gov/presidential-actions/2025/04/advancing-artificial-intelligence-education-for-american-youth/

97 Page, C. (2025, February 3). What Powerschool won't say about its data breach affecting millions of students *TechCrunch*. Retrieved February 10, 2025, from https://techcrunch.com/2025/02/03/what-powerschool-isnt-saying-about-its-massive-student-data-breach/

98 Barnum, M. (2024, February 16). We tested an AI tutor for kids. It struggled with basic math. *Wall Street Journal*. Retrieved December 4, 2024, from https://www.wsj.com/tech/ai/ai-is-tutoring-students-but-still-struggles-with-basic-math-694e76d3

99 For an interesting discussion of the forces that lead to the deterioration of digital platforms and reluctance of customers to abandon those platforms, see:

Roberts, D. (2024, December 11). Can we avoid the enshittification of clean-energy tech? A conversation with Cory Doctorow [podcast]. *Volts*. Retrieved July 16, 2025, from https://www.volts.wtf/p/can-we-avoid-the-enshittification

100 Google (n.d.). Better learning. Brighter futures [webpage]. Retrieved April 11, 2025, from https://edu.google.com/

101 Google (2024, November 8). Google (2024, November 8). Expanding access to the Gemini app for teen students in education. *Google Workspace Updates*. Retrieved May 28, 2025, from https://workspaceupdates.googleblog.com/2024/10/gemini-app-access-for-teen-students-workspace-education.html

102 Kahoot! (2025). Efficient preparation: Make classroom sessions more engaging with Kahoot! [webpage]. Retrieved March 13, 2025, from https://kahoot.com/schools/

103 Zearn (2025). Multiply the 'aha' moments in your classroom [webpage]. Retrieved April 11, 2025, from https://about.zearn.org/

104 Nichols, T.P. & Garcia, A. (2022). Platform studies in education. *Harvard Educational Review, 92*(2), 209-230. Retrieved May 12, 2025, from https://doi.org/10.17763/1943-5045-92.2.209

Garcia, A. & Nichols, T.P. (2021). Digital platforms aren't mere tools — they're complex environments. *Phi Delta Kappan, 102*(6), 14-19. Retrieved May 12, 2025, from https://doi.org/10.1177/0031721721998148

105 Sanchez-Cartas, J.M. & León, G. (2021). Multisided platforms and markets: A survey of the theoretical literature. *Journal of Economic Surveys, 35*(2), 452-487. Retrieved May 12, 2025, from https://doi.org/10.1111/joes.12409

106 This market dynamic has been theorized as a unique political-economic formation, variously termed "platform capitalism," "surveillance capitalism," and "technofeudalism."

Srnicek, N. (2017). *Platform capitalism*. Malden, MA: Polity.

Zuboff, S. (2019). *The age of surveillance capitalism: The fight for a human future at the new frontier of power*. New York, NY: Public Affairs.

Varoufakis, Y. (2024). *Technofeudalism: What killed capitalism*. New York, NY: Melville House.

107 Van Dijck, J. (2013). *The culture of connectivity: A critical history of social media*. New York, NY: Oxford University Press.

Bratton, B. (2016). *The stack: On software and sovereignty*. Cambridge, MA: MIT Press.

Nichols, T.P. & Garcia, A. (2022). Platform studies in education. *Harvard Educational Review, 92*(2), 209-230. Retrieved May 12, 2025, from https://doi.org/10.17763/1943-5045-92.2.209

Garcia, A. & Nichols, T.P. (2021). Digital platforms aren't mere tools — they're complex environments. *Phi Delta Kappan, 102*(6), 14-19. Retrieved May 12, 2025, from https://doi.org/10.1177/0031721721998148

108 This promise was in the inspiration for multiple subfields of educational research, including "educational data mining" and "learning analytics. See, for example:

Romero, C. & Venutra, S. (2010). Educational data mining: A review of the state-of-the-art. *IEEE Transactions on Systems, Man, and Cybernetics, Part C: Applications and Reviews, 40*(6), 601-618. Retrieved May 13, 2025, from https://doi.org/10.1109/TSMCC.2010.2053532

Siemens, G. (2013). Learning analytics: The emergence of a discipline. *American Behavioral Scientist, 57*(10), 1380-1400. Retrieved May 13, 2025, from https://doi.org/10.1177/0002764213498851

109 Selwyn, N. (2016). 'There's so much data': Exploring the realities of data-based school governance. *European Educational Research Journal, 15*(1), 54-68. Retrieved May 13, 2025, from http://doi.org/10.1177/1474904115602909

Pangrazio, L., Selwyn, N., & Cumbo, B. (2023). A patchwork of platforms: Mapping data infrastructures in

schools. *Learning, Media, & Technology, 48*(1), 65-80. Retrieved May 13, 2025, from https://doi.org/10.1080/17439884.2022.2035395

Pangrazio, L., Stornaiuolo, A., Nichols, T.P., Garcia, A., & Philip, T. (2022). Datafication meets platformization: Materializing data processes in teaching and learning. *Harvard Educational Review, 92*(2), 257-283. Retrieved May 13, 2025, from https://doi.org/10.17763/1943-5045-92.2.257

110 Andrejevic, M. (2013). *Infoglut: How too much information is changing the way we think and know*. New York, NY: Routledge.

111 Zearn (n.d). State standards alignment. Retrieved May 13, 2025, from https://about.zearn.org/state-standards-alignment

112 Zearn (n.d). *Seton Catholic Schools adopting Zearn math curriculum across all twelve Wisconsin Schools*. Retrieved May 13, 2025, from https://about.zearn.org/press-releases/seton-catholic-schools-adopts-zearn-math

113 Martone, A. & Sireci, S.G. (2009). Evaluating alignment between curriculum, assessment, and instruction. *Review of Educational Research, 79*(4), 1332-1361. Retrieved May 13, 2025, from https://doi.org/10.3102/0034654309341375

114 See, for example: Polikoff, M. (2015). How well aligned are textbooks to the Common Core standards in mathematics. *American Educational Research Journal, 52*(6), 1185-1211. Retrieved May 13, 2025, from https://doi.org/10.3102/0002831215584435

115 Williamson, B., Molnar, A., & Boninger, F. (2024). *Time for a pause: Without effective public oversight, AI in schools will do more harm than good*. Boulder, CO: National Education Policy Center. Retrieved April 11, 2025, from http://nepc.colorado.edu/publication/ai

116 Boninger, F., Molnar, A., & Saldaña, C.M. (2019). *Personalized learning and the digital privatization of curriculum and teaching*. Boulder, CO: National Education Policy Center. Retrieved April 8, 2025, from https://nepc.colorado.edu/publication/personalized-learning

117 Bulger, M. (2016, July 22). *Personalized learning: The conversations we're not having* (pp. 11, 14-15). Data & Society. Retrieved June 3, 2020, from https://www.datasociety.net/pubs/ecl/PersonalizedLearning_primer_2016.pdf

118 The concept of "platform governance" has been used to describe how platforms increasingly function as de facto policy actors in schools—introducing curricular imperatives that may differ from those of content area experts. See Nichols, T.P. & Dixon-Román, E. (2024). Platform governance and education policy: Power and politics in emerging edtech ecologies. *Educational Evaluation and Policy Analysis, 46*(2), 309-328. Retrieved May 13, 2025, from http://doi.org/10.3102/01623737231202469

Several recent studies explore such tensions in specific disciplinary domains, like math and science. See:

Kavanagh, S.S., Bernhard, T., Gibbons, L.K. (2025). 'Someone else in the world is trying to teach you': Teachers' experiences with platformized instruction. *Learning, Media, and Technology, 50*(2), 112-128. Retrieved July 24, 2025, from https://doi.org/10.1080/17439884.2024.2337396

Bernhard, T. (2025). *The screens between us: Capturing how digital platforms media science instruction in urban US classrooms* [Doctoral dissertation]. University of Pennsylvania. Retrieved July 24, 2025, from https://repository.upenn.edu/bitstreams/f72feff9-5245-4da1-9c7a-09caae9c0249/download

119 Sanchez-Cartas, J.M. & León, G. (2021). Multisided platforms and markets: A survey of the theoretical literature. *Journal of Economic Surveys, 35*(2), 452-487. Retrieved May 12, 2025, from https://doi.org/10.1111/joes.12409

120 Van Dijck and colleagues devote a chapter to this asymmetry in their expansive study of platform power across different social sectors, including education. See: van Dijck, J., Poell, T., & de Waal, M. (2018). *The platform society: Public values in a connective world*. New York, NY: Oxford University Press.

This relationship has also been various theorized as a form of "platform governance." See, for example:

Gorwa, R. (2019). What is platform governance? *Information, Communication, & Society, 22*(6), 854-871. Retrieved May 13, 2025, from http://doi.org/10.1080/1369118X.2019.1573914

Nichols, T.P. & Dixon-Román, E. (2024). Platform governance and education policy: Power and politics in emerging edtech ecologies. *Educational Evaluation and Policy Analysis, 46*(2), 309-328. Retrieved May 13, 2025, from https://doi.org/10.3102/01623737231202469

121 Coffey, L. (2023, July 25). College 'email for life' at risk for many. *Inside Higher Ed*. Retrieved May 13, 2025, from https://www.insidehighered.com/news/tech-innovation/2023/07/25/college-email-life-risk-google-limits-free-storage

122 Hehr, K. (2023, August 25). Make the most of data storage in Google Workspace for Education. *EdTech Magazine*. Retrieved May 13, 2025, from https://edtechmagazine.com/k12/article/2023/08/make-most-data-storage-google-workspace-education

123 Pierce, D. (2023, June 30). Who killed Google Reader? *The Verge*. Retrieved May 13, 2025, from https://www.theverge.com/23778253/google-reader-death-2013-rss-social

124 Nichols, T.P. & Monea, A. (2022). De-escalating dataveillance in schools. *Phi Delta Kappan, 104*(4), 23-27. Retrieved May 13, 2025, from https://doi.org/10.1177/00317217221142978

125 Singer, N. (2023, January 18). How the Netherlands is taming big tech. *New York Times*. Retrieved May 13, 2025, from https://www.nytimes.com/2023/01/18/technology/dutch-school-privacy-google-microsoft-zoom.html

126 Sometimes schools use Zearn on a "click through" basis in which case no data privacy agreement is provided. This is the case, for example, in the Boulder Valley School District. Colorado Springs' Academy District 20, on the other hand, apparently has a signed contract with Zearn because it posts its Zearn DPA on its website, as per Colorado law for contracted providers. This DPA specifies Zearn's practices for "secure data deletion" and for de-identification, and its practices for its own secure data deletion and for requiring its subcontractors to do the same. The DPA defines "Secure Deletion" as follows:

1.10 "Securely Destroy" means to remove District Data from Contractor's systems, paper files, records, databases, and any other media regardless of format, in accordance with the standard detailed in National Institute of Standards and Technology ("NIST") SP 800-88 Guidelines for Media Sanitization so that District Data is permanently irretrievable in Contractor's and its Subcontractors' normal course of business.

The DPA defines "District Data" as:

1.2 "District Data" means any Personally Identifiable Information, Record, Education Record and all Personally Identifiable Information included therein or derived therefrom that is not intentionally made generally available by the District on public websites or publications but is made available directly or indirectly by the District to Contractor or that is otherwise collected or generated by Contractor in connection with the performance of the Services.

Academy District 20 (n.d.). Documents & Forms [webpage]. Retrieved March 28, 2025, from https://files.asd20.org/?selectedCategories=Data%20Protection%20Addendum&selectedOrganizationIds=26eaf390-d8ab-11e9-a3a8-5de5bba4f125

Boulder Valley School District (n.d.) BVSD On-Demand Service Provider List [Google Sheet]. Retrieved April 29, 2025, from https://docs.google.com/spreadsheets/d/1sDjUhrSHwPhQigjd96krqYdxwnNk4KWU4F4YL2X

qtaE/edit?gid=1766928039#gid=1766928039

127 Kahoot! (2025). Trust Center [webpage]. Retrieved March 13, 2025, from https://trust.kahoot.com/

128 The "Google Coud Terms Directory" contains links to nine documents, Links to other privacy-related documents are embedded in those.

Google (n.d.). Google Cloud terms directory [webpage]. Retrieved March 10, 2025, from https://cloud.google.com/product-terms#google-workspace-for-education

See also:

Schwarz, et al. v. Google, No. 3:25-cv-03125 (N.D. Cal. Apr. 7, 2025).

129 The FAQs reference the Family Education Records Privacy Act [FERPA], the Children's Online Privacy Protection Act [COPPA], and the Child Internet Protection Act [CIPA]. The FAQs note that "Google advertising is turned off for G Suite so no personal student information is collected for commercial purposes." It fails to mention that "G Suite" (a former name for Google Workspace for Education, whose use suggests that the FAQ has not been updated for several years) does not include that "additional services" that children are likely to use, such as search and YouTube, do collect student data for commercial purposes.

Cheyenne Mountain School District (2025). "G-Suite FAQ's." Retrieved March 11, 2025, from https://www.cmsd12.org/o/cmsd/page/g-suite-faqs

130 "Personally identifiable" information may also be called "personal" or "district" information. The United States Department of Education defines "personally identifiable information" (PII) as "includ[ing] information that can be used to distinguish or trace an individual's identity either directly or indirectly through linkages with other information." The California Consumer Privacy Act (CCPA) defines "personal information" as "information that identifies, relates to, describes, is reasonably capable of being associated with, or could reasonably be linked, directly or indirectly, with a particular consumer or household" (the law continues to provide specific examples of personal information.

California Civil Code § 1798.140(v)(1). Retrieved April 29, 2025, from https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=CIV&sectionNum=1798.140

Protecting Student Privacy, Department of Education (n.d.). Personally Identifiable Information (PII) [webpage]. Retrieved April 29, 2025, from https://studentprivacy.ed.gov/content/personally-identifiable-information-pii

131 The privacy policies do not reveal what data are used for, with language that offers only vague examples while allowing for myriad additional, unspecified, uses. Kahoot!'s language is not at all unusual: "...we may use and disclose such anonymized information for any purpose, including for analytics purposes, to help us understand how our products are used and improve upon them." Zearn's privacy policy states: "When we anonymize your students, we remove all personal identifiers including, first and last name, student ID number, and date of birth. We do not re-identify your data once it is anonymized. We retain aggregated, anonymized information for some of the purposes described in Section 2 above."

Kahoot! (2025 March 12). Kahoot! privacy notice (section 2.7). Retrieved March 13, 2025, from https://trust.kahoot.com/privacy-policy/

Zearn (2022, July 8). Privacy policy. Retrieved February 7, 2025, from https://about.zearn.org/privacy

132 Computer scientists have known for a long time how to re-identify data.

See:

Narayanan, A. & Shmatikov, V. (2008). *Robust de-anonymization of large sparse datasets*. SP '08 Proceedings of the 2008 IEEE Symposium on Security and Privacy, pp. 111-125. Retrieved July 17, 2025, from

https://doi.org/10.1109/SP.2008.33

Stokes, P. (2017, January 27). The 'five safes' – Data privacy at ONS [blog post]. *National Statistical*. Retrieved July 17, 2025, from https://blog.ons.gov.uk/2017/01/27/the-five-safes-data-privacy-at-ons/

133 For more on the market for student data, see:

Boninger, F., Molnar, A., & Barbour, M.K. (2020). *Issues to consider before adopting a digital platform or learning program* (Section 3—Privacy and data security issues to consider before adopting a digital platform or learning program). Retrieved July 17, 2025, from https://nepc.colorado.edu/publication/virtual-learning

Cardozo, N. (2015, October 14). *Internet companies: Confusing consumers for profit*. Electronic Frontier Foundation. Retrieved July 13, 2020, from https://www.eff.org/deeplinks/2015/10/Internet-companies-confusing-consumers-profit

Russell, N.C., Reidenberg, J.R., Martin, E., Norton, T.B. (2018, June 6). *Transparency and the marketplace for student data* (p. 3). Center on Law and Information Policy, Fordham University. Retrieved July 13, 2020, from https://ir.lawnet.fordham.edu/cgi/viewcontent.cgi?article=1003&context=clip

134 Federal and state laws allow for the distinction between personal and de-identified data, but as Elodie Currier explained in an award-winning 2023 article, "The concept of 'de-identified' data is largely a mirage. Many of the categories that courts and policymakers refer to as "anonymous" data are easily identifiable alone or in conjunction with publicly available datasets. In 1996, eighty-seven percent of Americans could be identified by their 'birth date, gender, and zip code' alone, as demonstrated by Latanya Sweeney after the Massachusetts Group Insurance Commission published 'anonymized' data showing the hospital visits of state employees.... Claims that aggregation of de-identified data is a meaningful barrier to re-identification similarly hold little merit."

Currier, E.O. (2023). *The myth of anonymity: De-identified data as legal fiction*. American Bar Association. Retrieved April 29, 2025, from https://www.americanbar.org/groups/antitrust_law/resources/newsletters/myth-of-anonymity/

Further, legal studies scholars have argued that, even if it were possible to truly de-identify data, the most valuable asset for platform providers is not personal data, but aggregate data, which can be mined for insights that can inform further product developments better than personally identifiable datapoints.

See:

Viljoen, S. (2021). A relational theory of data governance. *The Yale Law Journal, 131*(2), 573-654. Retrieved May 13, 2025, from https://www.jstor.org/stable/45400961

135 Zearn (2020, January 15). *Zearn, the nonprofit behind the top-rated curriculum Zearn Math, introduces intervention program*. Retrieved May 13, 2025, from https://about.zearn.org/press-releases/intervention-program

136 Kahoot! (2025 March 12). Kahoot! privacy notice (section 9). Retrieved March 13, 2025, from https://trust.kahoot.com/privacy-policy/

137 Kahoot! (2025 March 12). Kahoot! privacy notice (section 9). Retrieved March 13, 2025, from https://trust.kahoot.com/privacy-policy/

138 We asked Kahoot! via its website (https://support.kahoot.com/hc/en-us/requests/new) to explain how it how it permanently deletes or destroys the relevant Personal Information, and how it decides whether to delete/destroy or anonymize the information. Its initial emailed response explained the process by which a user could delete their account. Follow-up emails, clarifying that the question related to Kahoot!'s internal processes, were unanswered.

Kahoot! Support (2025, July 26, August 18, August 27). Personal communication (email) with Faith Boninger.

139 Data Protection Addendum, Zearn and Academy District 20, August 30, 2017 (clause 9.1). Retrieved March 28, 2025, from https://files.asd20.org/?selectedCategories=Data%20Protection%20Addendum&selectedOrganizationIds=26eaf390-d8ab-11e9-a3a8-5de5bba4f125

140 "Data Deletion: Zearn achieves secure data deletion through anonymization. When student data is deleted — whether due to a request by the account holder, termination of a school/district account, or prolonged inactivity — Zearn anonymizes the data. Once anonymized, the data cannot be re-identified. If used later, it is only in its anonymized form; and may be used by Zearn in aggregate form to understand and improve Zearn Math."

O'Sullivan, A. (2025, May 22). Personal communication (email) with Faith Boninger.

141 The Family Educational Rights and Privacy Act (FERPA) originally included a narrow "school official" exemption that allowed designated school personnel to access records for legitimate educational purposes. In 2008 and 2011, U.S. Education Department expanded its definition of "school officials," as used in FERPA, to include "contractors, consultants, volunteers, or other third parties" that perform "an institutional service or function for which the agency or institution would otherwise use employee." Ed tech companies (including Google, Kahoot!, and Zearn), rely on this definition to claim school official status.

Privacy Technical Assistance Center, U.S. Department of Education (n.d.). Who is a "school official" under FERPA? Retrieved August 25, 2025, from https://studentprivacy.ed.gov/faq/who-school-official-under-ferpa

Rotenberg, M. & Barnes, K. (2013, January 28). Amassing student data and dissipating privacy rights. *Educause Review Online*. Retrieved August 25, 2025, from https://er.educause.edu/articles/2013/1/amassing-student-data-and-dissipating-privacy-rights For further analysis, see:

Jones, M.L. (2025). AI is the latest threat to parental rights in education. *Institute for Family Studies*. Retrieved August 25, 2025, from https://ifstudies.org/blog/ai-is-the-latest-threat-to-parental-rights-in-education

142 Consistent with this suggestion, Kahoot!'s Privacy Notice includes, "Where appropriate, Kahoot! anonymizes information collected automatically before using it. Subject to applicable law and our agreements with our customers, we may use and disclose such anonymized information for any purpose, including for analytics purposes, to help us understand how our products are used and improve upon them." This suggests that data are "shared" in their anonymized form. Additionally, though, the language "Subject to applicable law and our agreements with our customers" both points to the significance of policy and suggests that use and disclosure of anonymized information may be negotiable. Likewise, the introductory section to the Privacy Notice also says, "We retain students' Personal Information only for as long as permitted by our agreements with our school or school district customers." This also suggests that schools and districts can negotiate retention periods for personal information.

Kahoot! (2025, March 12). Kahoot! privacy notice (Sections 1 and 2.7). Retrieved March 13, 2025, from https://trust.kahoot.com/privacy-policy/

143 For example:

Electronic Frontier Foundation (2015). Google deceptively tracks students' internet browsing, EFF says in FTC complaint [press release]. Retrieved August 21, 2025, from https://www.eff.org/press/releases/google-deceptively-tracks-students-internet-browsing-eff-says-complaint-federal-trade

Poritz, I. (2025). *Google hit with lawsuit over data collection on school kids (1)*. Bloomberg Law. Retrieved August 21, 2025, from https://news.bloomberglaw.com/litigation/google-hit-with-privacy-suit-over-data-collection-on-school-kids

144 According to Joel Schwarz, a privacy lawyer who collected and submitted 14 complaints to the USDOE, the department has not enforced FERPA in a long time. "Other than one enforcement decades ago, [I am] not familiar with any enforcement actions taken by DoE, nor any investigations concluded where they found a school or edtech provider in violation and penalized the school."

Schwarz, J. (2025, May 19). Personal communication (email) with Faith Boninger.

See also:

Jones, M.L. (2025). AI is the latest threat to parental rights in education. *Institute for Family Studies*. Retrieved August 25, 2025, from https://ifstudies.org/blog/ai-is-the-latest-threat-to-parental-rights-in-education

145 Future of Privacy Forum & the Software & Information Industry Association (2025). About the pledge [webpage]. Retrieved June 11, 2025, from https://studentprivacypledge.org/

Mollencamp, D. (2025, May). Edtech's 'privacy pledge' is going away. That doesn't mean student data is safe. *EdSurge*. Retrieved June 11, 2025, from https://www.edsurge.com/news/2025-05-14-edtech-s-privacy-pledge-is-going-away-that-doesn-t-mean-student-data-is-safe

146 Because its members include commercial ed tech providers, the Access4Learning Student Data Privacy Consortium is unable to dictate terms that fully protect schools' interests.

See:

Access4Learning Community (n.d.). About the Consortium [webpage]. Retrieved August 25, 2025, from https://privacy.a4l.org/privacy-community/

147 In a National Academies webinar exploring the report, *Strategies for Integrating AI into State and Local Government Decision Making*, report co-authors Nathan McNeese and Suresh Venkatasubramanian similarly recommended starting with staff and stakeholders' needs, what problems need to be solved, and possible ways to solve those problems. They explicitly warned that starting with the question of how to bring in AI would only create problems.

For the webinar:

Societal Experts Action Network (SEAN) (August 21, 2025). Strategies for integrating AI into state and local government decision making webinar [video recording]. National Academies of Sciences, Engineering, and Medicine. Washington, DC. Retrieved September 4, 2025, from https://www.nationalacademies.org/event/45463_08-2025_strategies-for-integrating-ai-into-state-and-local-government-decision-making-webinar

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Burke County Board of Education (2025, June 16). *A resolution encouraging balanced instruction*

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Appendix

To illustrate the challenges the research literature identifies, we examined a few popular platforms that offer a range of services that schools typically look for: learning management, curriculum and instruction, and assessment. *Google's Workspace for Education*,[1] an all-purpose learning management system (LMS), provides essential infrastructure; a communication interface between home and school; and a variety of additional services, such as search and YouTube. It also provides Google's Gemini artificial intelligence (AI) as a core service in its Education Standard and Plus editions.[2] *Kahoot!'s*[3] platform for instruction and assessment features gamified learning of academic content in the form of quizzes, called "kahoots"; assessment; and artificial intelligence features including an AI "question generator" and IBM SkillsBuild[4] gamified quizzes. *Zearn's*[5] math content-area learning and assessment offers standards-based math curriculum; classroom- and school-level data analytics reports; and gamification. We chose these platforms as examples because of their popularity and the wide range of features they offer. The challenges they illustrate also characterize, to varying degrees, any of the platforms currently on the market.

Transparency and Alignment

Does the platform provide evidence of its instructional effectiveness?

Google

No. Google makes no specific claims about improving learning outcomes through its Workspace for Education. The company's educational materials focus on descriptions of product features and guidance for implementation rather than evidence of efficacy.[6] No independent, peer-reviewed research demonstrates that Google Workspace for Education improves student achievement compared to non-digital alternatives.[7]

Kahoot!

Questionable. Kahoot!'s evidence base relies heavily on teacher testimonials rather than rigorous studies of learning outcomes.[8] The platform's promotional materials regularly use "engagement" and "learning" interchangeably without specifying how the former translates into the latter.[9] While some independent studies have found positive effects from the use of Kahoot! in classrooms, the majority of these were located in higher education settings and measured only short-term retention, making the generalizability of their findings for long-term improvements in K–12 schools questionable.[10]

Zearn

No. Zearn publishes "efficacy reports" as evidence of its product's effectiveness; however, these reports lack a transparent methodology, and they have not been subject to peer-review or independent verification.[11] The company's studies typically compare students who use Zearn more frequently with those who use it less, without accounting for selection bias or teacher effects.[12]

No independent, peer-reviewed studies have validated Zearn's claims about improved mathematics achievement.

Does the platform communicate the educational philosophies, methods, and supporting research that guide its design?

Google

No. Google Workspace for Education does not articulate an explicit educational philosophy. Marketing materials emphasize "collaboration," "productivity," and "21st-century skills," but do not define these concepts or their pedagogical foundations.[13] While Google describes its AI tools, like Gemini, as innovations for teaching and learning, it does not provide any public explanation of the instructional theory or research base informing the design or application of these products in schools.[14]

Kahoot!

Questionable. Kahoot! is transparent about its underlying philosophy of "gamification," openly marketing itself as providing engagement through "play" and "competition."[15] Its website and promotional materials do not reference or respond to prior research that has questioned the pedagogical value of extrinsic motivation through gaming.[16] The platform's recent AI integrations also lack a clear pedagogical justification beyond general claims of "efficiency."[17]

Zearn

No. Zearn describes its approach as "research-based"; however, it provides few specifics about the scientific research that informs its design.[18] The platform's promotional materials reference popular concepts like "growth mindset," but they do not elaborate on how this concept figures into Zearn's design of curriculum or personalized learning progressions.[19]

Can educators evaluate the quality and appropriateness of the platform's content, or its alignment to local curricular standards and instructional goals?

Google

Partially. As a multipurpose suite of resources,[20] not an explicit curriculum, Google Workspace for Education's appropriateness depends, in part, on how educators use it—what content they upload to it, and what tasks they assign to students. But several important facets of the platform's design are opaque to educators, including the algorithmic decision-making that drives its search results and YouTube recommendations.[21] The recent integration of Gemini AI introduces an additional layer of inscrutability, as educators cannot examine how the AI generates responses or whether its outputs are aligned with local educational goals.[22]

Kahoot!

Partially. Educators can review and create individual quiz questions but cannot evaluate

Kahoot!'s underlying assessment validity or reliability. The scoring algorithms, engagement metrics, and methods for determining "mastery" of content are proprietary and inaccessible to teachers and administrators.[23] While Kahoot! allows teachers to use its services to align their created content with local standards, the platform provides no transparency for how its gamification mechanics or AI-generated questions support specific learning objectives.

Zearn

No. Although Zearn markets itself as providing a comprehensive, standards-aligned K–8 mathematics curriculum, it provides no way for educators to review its complete curriculum in detail.[24] The platform offers documentation to show that it meets local standards in each U.S. state, but the software prevents independent evaluation of lesson quality, problem sets, or instructional sequences.[25] Most critically, the adaptive algorithms that determine student pathways, prerequisites, and readiness for advancement are "black boxed," making it impossible for educators to assess whether these decisions align with district instructional goals or individual student needs.[26]

Governance and Autonomy

Does the platform allow schools to maintain control over educational content and product functionality?

Google

Partially. As a platform that provides "infrastructure" rather than curriculum, Google Workspace for Education allows educators to create and share their own content through its services. However, Google maintains control over platform functionality, design decisions, and content moderation (e.g., algorithmic recommendations on its YouTube service).[27] Schools cannot access or modify the platform's proprietary code, nor influence systemwide changes, such as the integration of Gemini AI into products and services.[28]Also, as an "infrastructure," Google's ecosystem may create compatibility constraints, where schools are not able to use preferred applications or resources that do not integrate with Google's technical standards.[29]

Kahoot!

Partially. Educators can create quiz content and customize select default settings (e.g., scoring mechanisms, time constraints),[30] but they cannot modify core features of the platform or its fundamental orientation toward "gamified" learning. Kahoot! also integrates and actively markets features like "AI question generation"[31] and packaged programs like its collaboration with IBM SkillsBuild [32]—developments that shift the locus of authority over classroom content toward automated systems and third-party providers.

Zearn

No. Zearn develops and updates its curricular content and learning progressions internally. Educators may adjust the pacing and sequencing of lessons, but they cannot modify the con-

tent of lessons or change how the platform defines and assesses mastery.[33] Nor are they privy to the algorithmic decision-making that structures how students' learning progressions are "personalized." While schools have the option to implement Zearn as a supplement to, rather than a replacement for, its K–8 math curriculum, the company does advertise itself as a comprehensive curricular resource[34]—a form of adoption that effectively outsources math curriculum decisions to the platform.

How much control do education customers have when the platform updates its features or modifies its terms of service?

Google

Very little. Schools have minimal authority over updates to Google Workspace for Education. While administrators can configure certain settings through the Admin Console, they cannot refuse or delay core service modifications. Google's terms specify that the company may make "commercially reasonable changes" to its products, with the stipulation that it notify customers at least 12 months before discontinuing any core service.[35] However, even this stipulation has exceptions, as Google's terms state that it does not limit the company's "ability to make changes required to avoid a substantial economic or material technical burden."[36] They are also clear that continued use of Google products constitutes consent to any updates or modifications.[37]

Kahoot!

None. Kahoot!'s Terms and Conditions explicitly reserve the company's right to modify terms "from time to time," with user notification through email or in-app alerts.[38] The agreement also states that "continued use of the Services after such changes will constitute acknowledgement and agreement of the modified Terms."[39] Kahoot! also retains the right to change its Acceptable Use Policy "at any time without notice."[40]

Zearn

None. Zearn operates under standard Software-as-a-Service terms that grant the company broad modification rights. All platform updates, including changes to the curriculum and algorithmic recommendations, are controlled by Zearn, and continued access and use of its services "constitutes [a user's] acceptance of those changes."[41] For schools using Zearn as their primary curriculum, this can create vulnerabilities, as mid-year changes have potential to disrupt instruction with limited recourse for educators.[42]

How much leverage do educational customers have to negotiate contracts or influence the governance of the platform?

Google

Very little. Individual schools and all but the largest districts lack meaningful negotiating power with Google. The platform operates through standardized terms, applied uniformly across educational institutions—albeit with some variation by country to maintain compliance with local laws.[43] Only coordinated, high-level interventions have successfully influ-

enced Google's practices, as demonstrated in Denmark's multi-year negotiation over data protections—an effort that required substantial government backing and still applied only narrowly within its specific jurisdiction.[44]

Kahoot!

Limited to data practices for large districts. Individual schools or those using free/basic tiers have little to no leverage to negotiate. As a midsized platform, Kahoot! may negotiate specific contract provisions with large districts, particularly regarding data retention and deletion practices.[45] However, its platform functionality, pedagogical approach, and most other terms of service would be unlikely to be affected.

Zearn

Limited to data and service terms. Zearn demonstrates some flexibility in contract negotiations at the district level, particularly as they relate to data protections. Its Terms of Use include accommodations to ensure that the platform's data practices are compliant with variations in U.S. state laws.[46] However, this flexibility appears to extend only to data security and service terms, not to curriculum content, pedagogical methods, or platform functionality.

Surveillance and Privacy

Are the privacy protections associated with the product (number of relevant documents, ease of finding relevant documents, clarity of language and policies, etc.) clear to parents and school employees?

Google

No. The Google Cloud Terms Directory[47] lists nine Terms of Service Documents and policies governing the company's relationships with education customers. To find them, a school employee or parent would have to know that the "Terms Directory" is the place to look for these documents, rather than a more obvious place like the Google Workspace for Education Privacy Notice.[48] Other documents are linked within these documents, such that the only way to uncover all the relevant documents is to pore through the full collection. There is no clear listing of *all* the documents that contain privacy-relevant policies.

Kahoot!

No. Kahoot!'s Trust Center[49] provides a total of 21 documents including privacy documents (Cookie Notice,[50] Data Processing Agreement,[51] Privacy Notice[52]), legal documents (Terms & Conditions[53] and Master Service Agreement), descriptions of security practices, and other content that may or may not impact a user's data privacy. All the relevant documents appear to exist on that single page, but a parent or school employee would need to know to look there rather than, for example, at just the privacy notice linked at the bottom of the website homepage.

Kahoot!'s March 12, 2025, version of its privacy notice combined what had been two sepa-

rate documents: a general privacy notice and a student-specific one. This new policy is long and hard to parse. For example, if a parent or school employee looks up the policy's Section 3 on Use of Personal Information, they might reasonably assume that a child's "employer details" will not be used, but what about their "views and opinions"?

Zearn

Partially. Zearn posts two legal documents on its website: a privacy policy and terms of service. It also provides contracted districts with a data processing addendum. This small number of documents makes it easier for a school considering using Zearn to find and read all the relevant posted information. Some aspects of the policies are misleading. For example, as explained below, where the privacy policy says that Zearn will "delete" data, it actually means that Zearn will "anonymize" those data, and as "anonymize" is not a legal term, the process involved is not clear. Data are also aggregated at the time they are used, not at the time of anonymization.[54] This suggests that a student's data would be held in a single, anonymized, profile.

Does the company that provides the product sell or share data it collects from students?

Google

Questionable. Google does not sell data it collects from students as such, but it uses that data to develop other products that it does sell. Its business model is based upon using the data it collects to inform predictions about people (including students) and groups of people like them, and selling those predictions to its customers for advertising and marketing purposes. It also uses data it collects from students to inform the development of its own products, which it may sell back to schools or to other customers.

Kahoot!

Questionable. Kahoot!'s privacy notice defines "personal information" as "any information that identifies or can be used to identify an individual directly or indirectly." It defines "student data" as "Personal Information that Kahoot! processes about students on a school or teacher´s behalf as authorized by the school for the provision of the School Services." According to the privacy notice, "We do not sell Personal Information and we do not share Personal Information with third-parties for marketing purposes."[55] The privacy notice spells out several other circumstances in which Kahoot! does share "personal information, including with third-party service providers, potential buyers, public institutions, and professional advisors. It "never shares information about Children" with social media partners.[56]

The section on sharing personal information is followed by, "Regardless of the above, Kahoot! does not sell Personal Information and we will never share or sell Student Data for marketing purposes." The Privacy Notice does not define "marketing purposes," to clarify, for instance, whether such purposes include deriving insights from collected data to inform the development of new products to sell to schools and families. Nor does it explain the purposes for which it does share or sell Student Data. It does note that "When we have no ongo-

ing legitimate business need to process your Personal Information, it will be deleted or anonymized as soon as possible and in accordance with applicable law." And it states, "We may also share anonymized, aggregated information with selected third-parties for statistical purposes." Although the conditions under which a student's data is deleted or anonymized may be specified in a given district's contract with Kahoot!, it is not clear from the posted Privacy Notice. The same is true for the definition of "as soon as possible."

The policy notes, "Where appropriate, Kahoot! anonymizes information collected automatically before using it. Subject to applicable law and our agreements with our customers, we may use and disclose such anonymized information for any purpose, including for analytics purposes, to help us understand how our products are used and improve upon them."[57] This suggests that data are "shared" in their anonymized form. "Any purpose" is a broad category; product development is the only purpose specified as an example.

Zearn

Partially. According to Zearn's privacy policy, "We do not ever sell or rent your information." It does "share" information with third-party contractors that provide "business-related functions," and shares anonymized data with third-party contractors to "help us analyze the information." It also shares "in connection with an organizational change."[58] "Information" as used here appears to refer to personal information because the same section of the privacy appears to differentiate it from "aggregated, de-identified information."[59]

Does the company advertise to students?

Google

Partially. There are no explicit advertisements in Google Workspace for Education's "core services" (Gmail, Calendar, Classroom, Assignments, Contacts, Drive, Docs, Forms, Groups, Sheets, Sites, Slides, Chat, Meet, Vault, and Chrome Sync[60]). However, an important detail buried in Google's policy documents is that limitations on Google's use of personal information associated with Google Workspace for Education "core services" do not extend to "additional services," such as YouTube. [61, 62] This means, for example, that when students watch YouTube videos on their school-issued devices, they see advertisements, and advertisers may place cookies in their browsers.[63]

The Google Workspace for Education Privacy Notice, says that "none of the personal information collected in the core services is used for advertising purposes."[64] However, a 2025 complaint[65] accuses Google of using data captured during students' use of any service (including those Google classifies as "core") to inform its advertising business, even if it does not use those data to show students ads while using core services themselves or to build identifiable profiles of students.

Kahoot!

No. According to Kahoot's Privacy Notice, "The Services, App and Website do not include any third-party advertising, including any targeted advertising." Additionally, "We do not serve third party ads (including targeted ads) on our platforms and do not use information

we collect from students or others to serve targeted ads on other services. Kahoot! does not use or disclose information collected through the School Services for any targeted advertising purposes."[66]

Zearn

No. According to Zearn's Privacy Policy, "We do not use your information to engage in targeted advertising on our site."[67]

Does the company use student data for product development and/or research?

Google

Yes. Google's general Privacy Policy states that it uses customer information to "maintain and improve our services, as well as to "develop new services."[68] More specifically, the Google Workspace for Education Privacy Notice indicates that Google uses aggregated and anonymized data to "deliver and maintain the services that schools and students use" and to "improve the security and reliability of these services."[69] A 2025 complaint against Google also alleges that the company uses data captured during students' use of core services to inform its advertising business and the development of other products.[70]

Kahoot!

Yes. According to Kahoot's Privacy Notice, "2.7 Anonymized information: Where appropriate, Kahoot! anonymizes information collected automatically before using it. Subject to applicable law and our agreements with our customers, we may use and disclose such anonymized information for any purpose, including for analytics purposes, to help us understand how our products are used and improve upon them."

Zearn

Yes. According to the privacy policy, "Non-personal information, such as grade level, and other demographic information are used in aggregated, anonymized reporting to help us better understand how the program is used and to improve the program" and "[W]e may use aggregated, anonymized Program Use Information to improve and demonstrate the efficacy of Zearn."[71]

How long does the company retain personal student data?

Google

Google does not specify a retention period. The Google Workspace for Education Privacy Notice directs users to their "school admin" to "delete personal information in services or delete your entire account."[72] The document "How Google Retains Data We Collect" explains that "Some data you can delete whenever you like, some data is deleted automatically, and some data we retain for longer periods of time when necessary. When you delete data, we follow a deletion policy to make sure that your data is safely and completely removed from

our servers or retained only in anonymized form."[73]

Kahoot!

Kahoot!'s Privacy Notice does not provide a retention period. It states, "we [sic] will retain Personal Information in a form that permits identification only for as long as…your Personal Information [is] necessary in connection with the lawful purposes set out in this Privacy Notice, for which we have a valid legal basis (e.g., where your Personal Information are included in a contract between us and your school, and we have a legitimate interest in processing [that] Personal Information for the purposes of operating our business and fulfilling our obligations under that contract." That could be any amount of time. The Privacy Notice also says, "We retain students' Personal Information only for as long as permitted by our agreements with our school or school district customers."

Zearn

Zearn's privacy policy says that student "account data" may be "deleted" at the request of the school.[74] When we emailed Zearn to clarify what the company meant by "delete," its privacy representative responded that the account data would be "anonymized and all identifiable data associated with the account will be removed."[75] Account data is anonymized after 180 days of non-use or a school's request for "de-activation."

Does the company retain de-identified student data?

Google

Yes. Google's Privacy Policy states that when data is deleted, it may be "retained only in anonymized form."[76]

Kahoot!

Yes. According to Kahoot's Privacy Notice, "2.7 Anonymized information: Where appropriate, Kahoot! anonymizes information collected automatically before using it. Subject to applicable law and our agreements with our customers, we may use and disclose such anonymized information for any purpose, including for analytics purposes, to help us understand how our products are used and improve upon them. We will not seek to re-identify any information that we have anonymized." The Privacy Notice does not address a limit on retention of de-identified data.

Zearn

Yes. According to the privacy policy, "Non-personal information, such as grade level, and other demographic information are used in aggregated, anonymized reporting to help us better understand how the program is used and to improve the program" and "[W]e may use aggregated, anonymized Program Use Information to improve and demonstrate the efficacy of Zearn."[77]

What are the data disposal processes?

Google

Google's Privacy Notice refers parents to their school's "admin" regarding "service controls that can allow you to manage personal information."[78]

Kahoot!

Kahoot!'s Privacy Notice states that when it no longer needs personalized information, the company "will either: permanently delete or destroy the relevant Personal Information; or anonymize the relevant Personal Information."[79] The Privacy Notice does not explain how Kahoot! determines which approach it takes. We asked Kahoot! via its website (https://support.kahoot.com/hc/en-us/requests/new) to explain how it how it permanently deletes or destroys the relevant Personal Information, and how it decides whether to delete/destroy or anonymize the information. Its initial emailed response explained the process by which a user could delete their account. Follow-up emails, clarifying that the question related to Kahoot!'s internal processes, were unanswered.

Zearn

According to Zearn's Support representative, "The data is anonymized and all identifiable data associated with the account will be removed."[80]

Does the platform require informed consent from parents for a student to use this product?

Google

No. Google's "Additional Products Terms" document specifies that schools are responsible for "obtain[ing] parental consent for the collection and use of personal data in connection with those additional products."[81] Parental consent is not required for students to use Google Workspace for Education's "core" services. A 2025 complaint argues that "informed" parental consent cannot truly be obtained because Google does not share how it uses children's data.[82]

Kahoot!

No. Kahoot's Privacy Notice notes: "To the extent COPPA applies, our school or district customer provides us with any necessary consent on behalf of students' parents or guardians to permit use of Kahoot! in the classroom."[83, 84]

Zearn

No. According to Zearn's Terms of Use, "If you provide a child with access to the Services, you represent and warrant that you are the parent or legal guardian, or the educator or administrator of an educational institution and have obtained the necessary consents from the parent or legal guardian to provide such access."[85, 86]

Appendix Notes and References

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Özdemir, O. (2025). Kahoot! Game-based digital learning platform: A comprehensive meta-analysis. *Journal of Computer Assisted Learning, 41*(1), e13084. Retrieved June 13, 2025, from https://doi.org/10.1111/jcal.13084

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Storey, N.S. & Neitzel, A.J. (2025). *Evaluation of Zearn Supplemental with dedicated implementation support*. Center for Research and Reform in Education, The Johns Hopkins University. Retrieved June 13, 2025, from https://webassets.zearn.org/Implementation/EvaluationofZearnSupplementalwithDedicatedImplementationSupport.pdf?_gl=1*1lf2aaf*_gcl_au*NzE3ODc3MDI3LjE3NDcwODUyMjIuNjI4MzU3NDM0LjE3NDcwODUyNzEuMTcoNzA4NTI3MA..*_ga*MTU3OTA4MzM1MS4xNzQ3MDg1MjIy*_ga_RToS4RRBHQ*czE3NDk4MjI4OTYkbzMkZzEkdDE3NDk4NDQ3NTAkajQwJGwwJGgxNzcxNTIxNTQw

13 Google (n.d.). *Better learning, brighter futures*. Retrieved June 13, 2025, from https://edu.google.com/

14 Google (2024, November 8). Expanding access to the Gemini app for teen students in education. *Google Workspace Updates*. Retrieved June 13, 2025, from https://workspaceupdates.googleblog.com/2024/10/gemini-app-access-for-teen-students-workspace-education.html

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23 Kahoot!'s promotional materials claim to "support students' entire learning cycle from motivation to mastery," but its breakdown of how the software works shows that educators are not privy to the analysis that leads to such supports, they only receive reports, after the fact, that distill actionable insights for them to apply.

See, for example:

Kahoot! (2024, June 21). *The Kahoot! learning experience: Supporting students' entire learning cycle from motivation to mastery*. Retrieved June 13, 2025, from https://kahoot.com/blog/2024/06/21/the-kahoot-learning-experience-supporting-students-entire-learning-cycle-from-motivation-to-mastery/

Kahoot! (n.d.). *Kahoot! for schools: How it works*. Retrieved June 13, 2025, from https://kahoot.com/schools/how-it-works/.

24 The closest thing to a comprehensive look at its curriculum that Zearn provides is a "Curriculum Map" that provides a birds-eye-view of its coverage.

See:

Zearn (n.d). Curriculum map. Retrieved June 13, 2025, from https://help.zearn.org/hc/en-us/articles/115016098288-Curriculum-Map

25 Zearn (n.d.). State standards alignment. Retrieved June 13, 2025, from https://about.zearn.org/state-standards-alignment

26 For more on the "black box" nature of AI systems, see:

Narayanan, A. & Kapoor, S. (2024) *AI snake oil: What artificial intelligence can do, what it can't, and how to tell the difference*. Princeton University Press.

27 Outside of the United States, the lack of educational autonomy with regard to Google Workspace for Education's "Additional Services," like YouTube, have been the subject of regulatory disputes. In 2022, Denmark's Data Protection Agency temporarily banned Google products from Danish schools to pressure the company to allow for more institutional control—though the concessions were ultimately modest. In the U.S., where there is less regulatory oversight, Google's limitation on school autonomy have gone largely unchallenged.

See, for example:

Meaker, M. (2022, September 23). A Danish city built google into its schools—Then banned it. *WIRED*. Retrieved June 12, 2025, from https://www.wired.com/story/denmark-google-schools-data/

Kerssens, N., Nichols, T.P., & Pangrazio, L. (2023). Googlization(s) of education: Intermediary work brokering platform dependence in three national school systems. *Learning, Media, & Technology, 49*(3), 478-491. Retrieved June 12, 2025, from https://doi.org/10.1080/17439884.2023.2258339

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29 Perrotta, C., Gulson, K.N., Williamson, B., & Witzenberger, K. (2021). Automation, APIs, and the distributed labour of platform pedagogies in Google Classroom. *Critical Studies in Education, 62*(1), 97-113. Retrieved June 12, 2025, from https://doi.org/10.1080/17508487.2020.1855597

30 Kahoot! (2020, October 6). *7 Kahoot! features to tailor lesson dynamics to learning goals and students' needs*. Retrieved June 12, 2025, from https://kahoot.com/blog/2020/10/06/control-lesson-dynamics-with-kahoot/

31 Kahoot! (2023, June 6). *Unlock the power of AI in your classroom with Kahoot!'s new question generator*. Retrieved June 12, 2025, from https://kahoot.com/blog/2023/06/06/kahoot-ai/

32 Kahoot! (2025, May 8). *Explore AI and emerging tech to help build your students' career readiness with IBM SkillsBuild on Kahoot!* Retrieved June 12, 2025, from https://kahoot.com/blog/2025/05/08/ai-emerging-tech-career-readiness-ibm-skillsbuild/

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35 Google (n.d.). Google Workspace for Education terms of service (Section 1.4(a)). Retrieved June 12, 2025, from https://workspace.google.com/terms/education_terms/

36 Google (n.d.). Google Workspace for Education terms of service (Section 1.4(e)). Retrieved June 12, 2025, from https://workspace.google.com/terms/education_terms/

37 Google (n.d.). Google Cloud Terms of Service. Retrieved June 11, 2025, from https://cloud.google.com/terms

38 Kahoot! (2025, February 10). Terms and Conditions (Section 17). Retrieved June 12, 2025, from https://trust.kahoot.com/terms-and-conditions/

39 Kahoot! (2025, February 10). Terms and Conditions (Section 17). Retrieved June 12, 2025, from https://trust.kahoot.com/terms-and-conditions/

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Cone, L. (2023). Subscribing school: Digital platforms, affective attachments, and cruel optimism in a Danish public primary school. *Critical Studies in Education, 65*(3), 294-311. Retrieved June 12, 2025, from https://doi.org/10.1080/17508487.2023.2269425

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48 Google (n.d.). Google Workspace for Education privacy notice. Retrieved February 28, 2025, from https://workspace.google.com/terms/education_privacy/

49 Kahoot! (2025). Welcome to the Kahoot! Trust Center [webpage]. Retrieved March 13, 2025, from https://trust.kahoot.com/

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Kahoot! (2025, January 22). Data processing agreement. Retrieved March 13, 2025, from https://trust.kahoot.com/dpa/

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54 Zearn Support (2025, May 5). Personal communication [email] with Faith Boninger.

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56 As this appears in the section about sharing personal information, even though it says only "information," this

likely means personal information.

Kahoot! (2025, March 12). Kahoot! privacy notice (Section 6). Retrieved March 13, 2025, from https://trust.kahoot.com/privacy-policy/

57 Kahoot! (2025, March 12). Kahoot! privacy notice (Section 2.8). Retrieved March 13, 2025, from https://trust.kahoot.com/privacy-policy/

58 Zearn (2025, June 22). Privacy policy. Retrieved August 27, 2025, from https://about.zearn.org/privacy

59 Zearn (2025, June 22). Privacy policy. Retrieved August 27, 2025, from https://about.zearn.org/privacy

60 Google (n.d.). Google Workspace for Education Privacy Notice. Retrieved February 28, 2025, from https://workspace.google.com/terms/education_privacy/

61 It is unclear whether Search is a "core" service. The Google Workspace for Education Privacy Notice does not include it in its list of core services. That privacy notice forwards readers to a "Services Summary" document that lists "Google Cloud Search" among the "Google Workspace" Core Services. Search is also not explicitly mentioned in the document "Service categories available to Google Workspace for Education Users, which refers to " Core Services (like Gmail, Google Calendar, and Classroom) and other services (like Appsheet and Read Along)."

Google (n.d.). Google Workspace for Education Privacy Notice. Retrieved February 28, 2025, from https://workspace.google.com/terms/education_privacy/

Google (n.d.). Services Summary [webpage]. Retrieved March 11, 2025, from https://workspace.google.com/terms/user_features/

Google (2025). Service categories available to Google Workspace for Education users [webpage]. Retrieved April 2, 2025, from https://support.google.com/a/answer/6356441?hl=en

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Google (2025), Service categories available to Google Workspace for Education Users. Retrieved March 10, 2025, from https://support.google.com/a/answer/6356441

63 "We may share non-personally identifiable information publicly and with our partners — like publishers, advertisers, developers, or rights holders. For example, we share information publicly to show trends about the general use of our services. We also allow specific partners to collect information from your browser or device for advertising and measurement purposes using their own cookies or similar technologies.

If Google is involved in a merger, acquisition, or sale of assets, we'll continue to ensure the confidentiality of your personal information and give affected users notice before personal information is transferred or becomes subject to a different privacy policy."
Google (2024, September 16). Google privacy policy. Retrieved March 10, 2025, from https://policies.google.com/privacy#infosharing

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68 Google (2024, September 16). Google privacy policy. Retrieved June 11, 2025, from https://policies.google.com/privacy#whycollect

69 Google (2024, September 16). Google Workspace for Education Privacy Notice. Retrieved June 11, 2025, from https://workspace.google.com/terms/education_privacy/

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71 Zearn (2025, June 22). Privacy policy. Retrieved August 27, 2025, from https://about.zearn.org/privacy

72 Google (n.d.). Google Workspace for Education Privacy Notice. Retrieved February 28, 2025, from https://workspace.google.com/terms/education_privacy/

73 Google (n.d.). How Google retains data we collect. Retrieved May 12, 2025, from https://policies.google.com/technologies/retention

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78 Google (n.d.). Google Workspace for Education Privacy Notice. Retrieved February 28, 2025, from https://workspace.google.com/terms/education_privacy/

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84 A class action complaint against Google charges that “Informed” parental consent cannot ever really be obtained because Google does not share how it uses children’s data. This is the case with any education technology provider that does not explicitly tell parents how children’s data are used.

Schwarz, et al. v. Google, No. 3:25-cv-03125 (N.D. Cal. Apr. 7, 2025). Retrieved May 7, 2025, from https://www.bloomberglaw.com/public/desktop/document/SCHWARZetalvGoogleLLCDocketNo325cv03125NDCalApr072025CourtDocket?doc_id=X34FQRJ2DD08GPQDM0552CMCBL3

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86 A class action complaint against Google charges that “Informed” parental consent cannot ever really be obtained because Google does not share how it uses children’s data. This is the case with any education technology provider that does not explicitly tell parents how children’s data are used.

Schwarz, et al. v. Google, No. 3:25-cv-03125 (N.D. Cal. Apr. 7, 2025). Retrieved May 7, 2025, from https://www.bloomberglaw.com/public/desktop/document/SCHWARZetalvGoogleLLCDocketNo325cv03125NDCalApr072025CourtDocket?doc_id=X34FQRJ2DD08GPQDM0552CMCBL3