

Learning (r)evolution

Exploring artificial intelligence in K-12 education



A futures vision by Artefact



About this document

This document explores a variety of perspectives on how AI might impact K-12 education in the future. It is intended as an exploration of possible futures that can spark meaningful discussion, strategy, and planning for your organization and partners. By exploring what's possible, you might see what is preferable to ensure a smooth transition of your organization that fosters equitable outcomes for your stakeholders.



1 Overview

[Our research process](#)

[Who is this for](#)

[How to use future scenarios](#)

2 AI in Education

[Applications of AI in education](#)

[A youth view of education](#)

[Variable conditions](#)

3 Future Scenarios

[Four futures model](#)

[An ecological metaphor](#)

[A: Experimentation flames inequities](#)

[B: Industry calls for containment](#)

[C: Standards set a better path](#)

[D: Education emerges transformed](#)

4 Taking Action

[Imagining your AI future](#)

[Discussion guide](#)

[Getting connected](#)

Our educational system will be one of the many industries profoundly impacted by developments in AI.



70%

Reduction in grading time using AI tools

62%

Increase in test scores using adaptive learning tools

20%

Decrease in mathematics learning anxiety

In some cases, AI is already here – resulting in personalized learning experiences and cutting-edge assessment tools. To unpack whether AI will revolutionize or ruin the primary education system in the US, we conducted a study to analyze the technological, social, political, and economical shifts that have occurred and are likely to unfold over the next 3-7 years.

This work resulted in the development of four scenarios that bring to life the promises and perils of technology and explore how we might mitigate risks and maximize opportunities, so that all students can benefit from a high-quality education.

Our research process



Establishing foresight that is grounded in research and practice.

Our research is based on prior knowledge we gained from projects in the youth, education, and technology spaces, firsthand experimentation with generative AI tools, and extensive secondary research. During our process, we used a combination of trends analysis and foresight techniques such as signal scanning and future wheels to:

- identify signals, trends, and drivers of change around AI and education
- explore how these factors interact and what likely effects or impacts would result and when
- develop scenarios and write narratives to help readers immerse themselves in the everyday lives of people in these futures

Who is this for?

Tech Industry

Technology companies and startups working on education technology products or integrations.

Product leaders and designers working in education technology who want to understand potential ethical and equity considerations and raise them with their teams.

Policymakers & NGO

Policymakers and education decision-makers who want to understand the potential challenges, risks, and opportunities around AI in education so they can develop proactive policies and recommendations.

Non-governmental organizations and funders who want informed perspectives on building AI education technology programs and public goods and are developing grants to support education technology and equity efforts.

Academia

Researchers and academics working on projects at the intersection of AI, education, technology, and equity.

Educators & Students

Teachers and educators who want to anticipate the skills they and their students will need.

Parents, guardians, and students who want to understand what's on the edtech horizon so they can advocate for the educational futures they want for themselves and the people they care about.



Challenge default mindsets and imagine preferable futures.

Purpose

The scenarios help stakeholders explore how trends affecting US K-12 education might interact, develop, and evolve and what people could experience in those future circumstances. Using these future stories, stakeholders can challenge assumptions and mindsets to imagine truly people-centered approaches to change – ones that center equitable experiences and prioritize human flourishing.

What's included

Each scenario features a description of how transformative trends around technology and society might intersect and a narrative story that brings a future education technology experience to life.



Spark meaningful conversations with your team and partners.

Purpose

The scenarios are intended to spark questions and conversations that help stakeholders critically evaluate whether the AI-enabled tools they are building, implementing, or experiencing in their education systems are supporting their intended outcomes. They are thought-starters rather than full-formed future artifacts and serve as provocations instead of predictions.

What's included

We've drafted a set ethical and equity considerations and discussion prompts for you to take into your next meeting. We are also available to start a conversation to help you connect this work to yours.



AI in Education

Applications of AI in education

A youth view of education

Variable conditions



AI is already helping educators operate more efficiently and be more responsive to student needs.



AI in education takes on many forms and can be used by anyone involved in an academic setting or supporting learning at home, such as teachers, parents, students, and administrative members. Personalized learning tools can identify effective pedagogical approaches that adapt to individual student needs. AI chatbots can improve access to high-quality counseling and help provide individualized tutoring support.

In addition, administrators can gain deeper insights into progress at school, district, and county levels through the analysis of individual learner data that can be tracked over time. That same learner data can support educators in identifying the most effective teaching modalities to establish best teaching practices and support relevant curriculum development.



Meeting unique learner needs

Personalized learning

Improving accessibility

(language translation, supporting people with a visual or learning impairment)

Providing at-home tutoring support

Matching interest and skills with career pathways



Automating operations and assessment

Automating non-teaching activities
(grading, etc)

Automating school operations
(scheduling, etc)

Assessments of district, school, teacher,
and student performance



Supporting educators

Creating courses / smart content

Designing curriculums

Supporting teacher training



What do youth want the future of education to look like?

Accessible

Education will be available anywhere, anytime.

During the pandemic, youth learned that they value the ability to engage with their education when and where they want. Youth expect AI to continue to support and accelerate a remote learning environment with AI-driven diagnostic assessments replacing traditional grading and exams and virtual teachers replacing in-person teachers.

[UNESCO Report, 2022](#)

Collaborative

Teachers and students will be equal partners in students' learning journeys, with teachers shifting to more of a facilitator role.

Youth expect a shift in the power dynamic between themselves and teachers that will result in a more collaborative relationship. In the spirit of owning their educations, youth want the opportunity to provide teachers with feedback.

[UNESCO Report, 2022](#)

Relevant

Student curriculums will be tailored to reflect the topics they are interested in.

Youth want to learn things that are relevant to their lives and future goals and do not want to waste their time learning things they will never use. They expect schools to make curriculums more experiential and hands-on by incorporating real-world applications and giving students opportunities to work on projects that are meaningful to them.

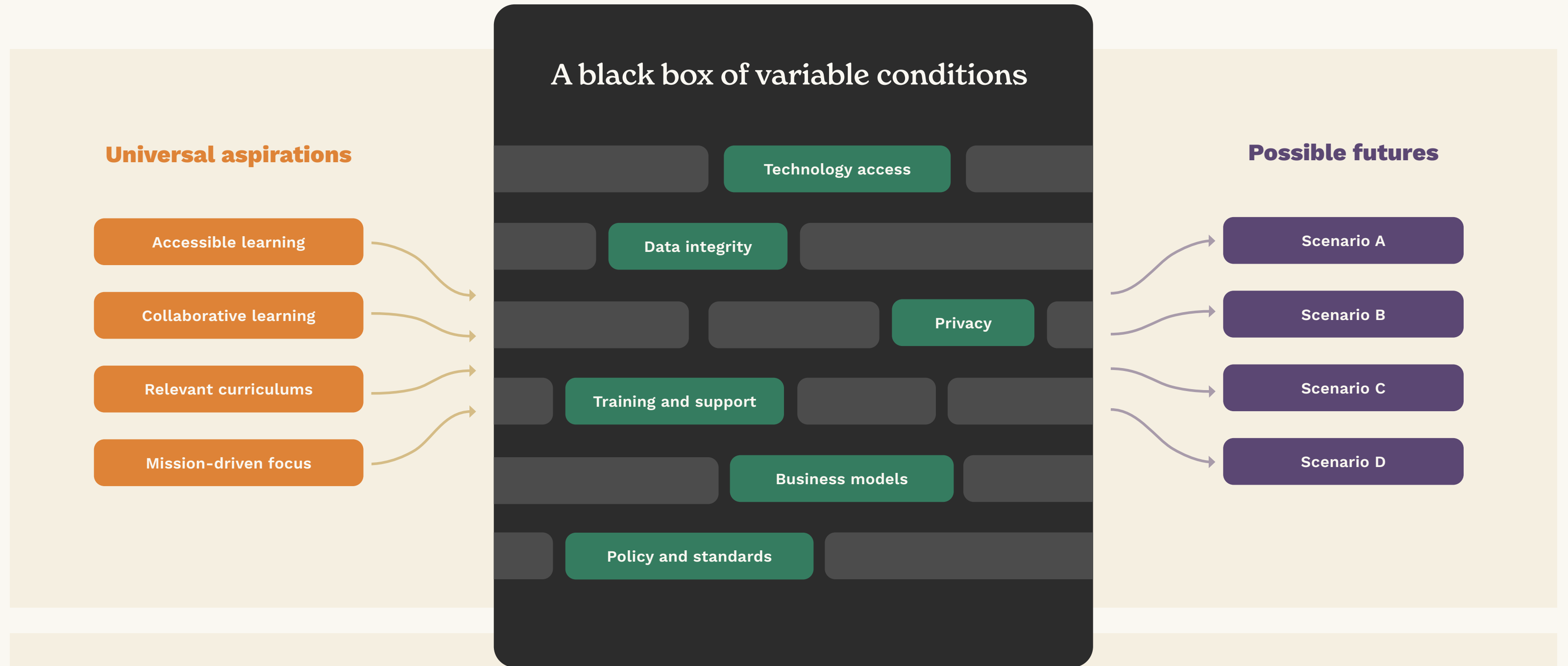
[Forbes, Apr 2022](#)

Mission-driven

Schools will become centers for generating and implementing solutions for global issues.

Youth expect their educational institutions to go beyond creating awareness about global issues, to playing an active role in imagining and implementing solutions. For example, schools may become places to mobilize climate policies or serve as shelters in times of crisis.

[UNESCO IESALC Video, 2022](#)



Future scenarios are all grounded in universal conditions informed by generational trends, but diverge into different paths based how they might be impacted by a “black box” of variable conditions.

Variable conditions shaping AI in education

1

Access to tools and technologies

Will access to AI tools and resources be limited, widening historical gaps between different student groups and schools, or will we find a way to bridge the divide?

LIMITED

UBIQUITOUS

2

Development of ed-tech business models

Though AI tools and resources may be pervasive and widely adopted, will ed-tech business models cater to those who have a higher ability to pay, resulting in better outcomes for the few?

ELITIST

AFFORDABLE

3

Trustworthy AI and dataset integrity

Will the AI systems of tomorrow perpetuate biases and dominant narratives that exist in society, or will guardrails be put in place to ensure AI systems are inclusive and equitable?

BIASED

FAIR

4

Privacy and data ownership

Will AI systems protect student and educator privacy and provide them with ownership and control over their data and will it matter as they look to adopt AI-enabled solutions?

EXPLOITATIVE

PROTECTIVE

5

Evolution of learning standards

Will AI-enabled education systems evolve to recognize and support students' different talents and interests, or will it hold students to more stringent, homogenized academic standards?

HOMOGENIZED

PERSONALIZED

6

Support for admin and educators

Will education systems support already overburdened administrative staff and teachers in learning new skills or pedagogies, or will they be left to fend for themselves?

UNSUPPORTED

SUPPORTED



Future Scenarios

Four futures model

An ecological metaphor

Scenario A: Experimentation flames inequities

Scenario B: Industry calls for containment

Scenario C: Standards set a better path

Scenario D: Education emerges transformed



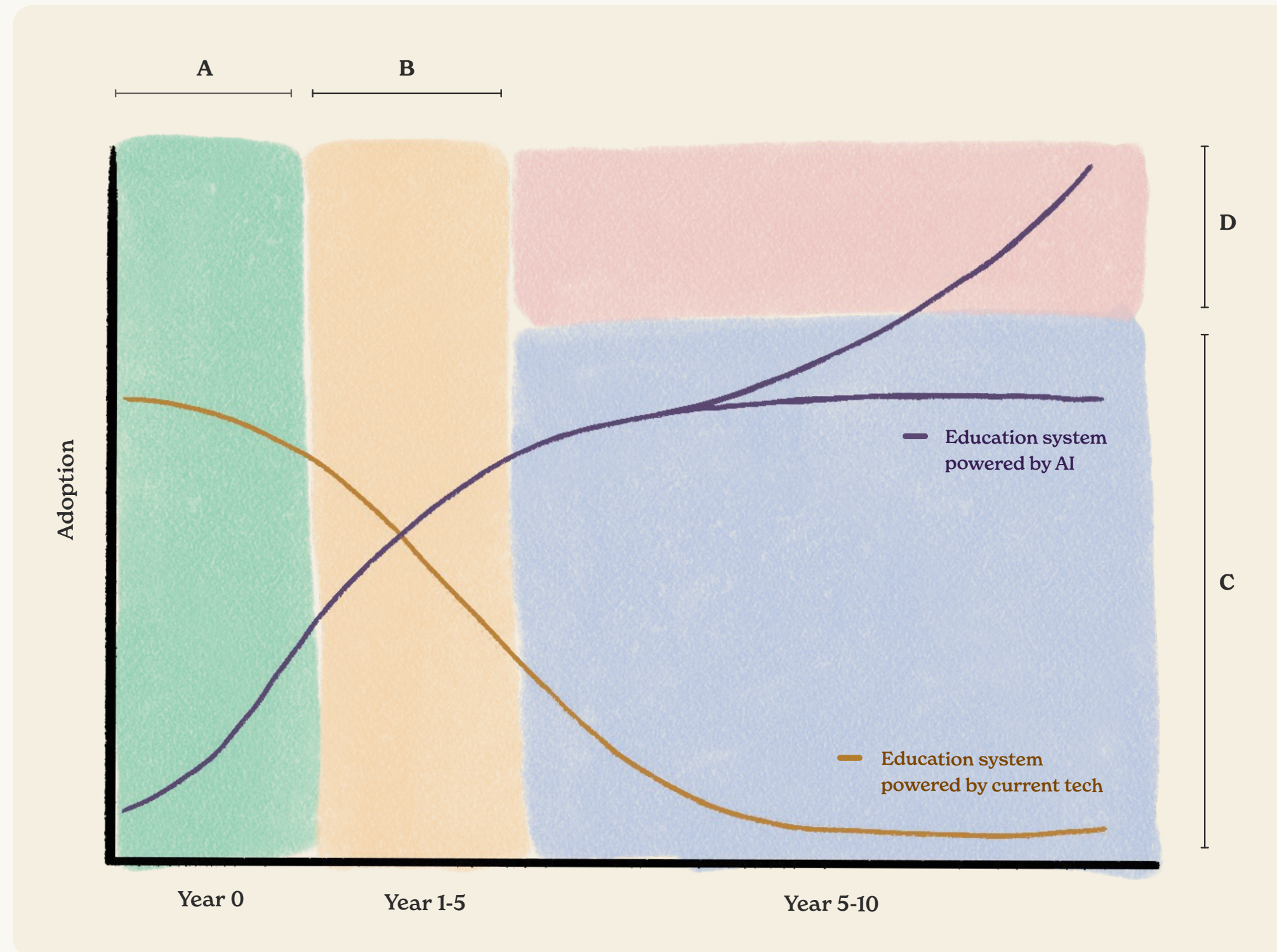
AI's evolution in education
may be understood by
looking at the underlying
dynamics of systems change.

We used Smart's Four Futures Archetypes as inspiration for the scenario stories, which model growth phases found in any self-maintaining network of social, organizational, economic, and technological complexity.



Four futures model

Four future scenarios occur at different times over the next 10 years.



A Experimentation flames inequities

The initial phase of relatively unrestrained growth of AI education technology that doesn't yet fundamentally change the education ecosystem.

B Industry calls for containment

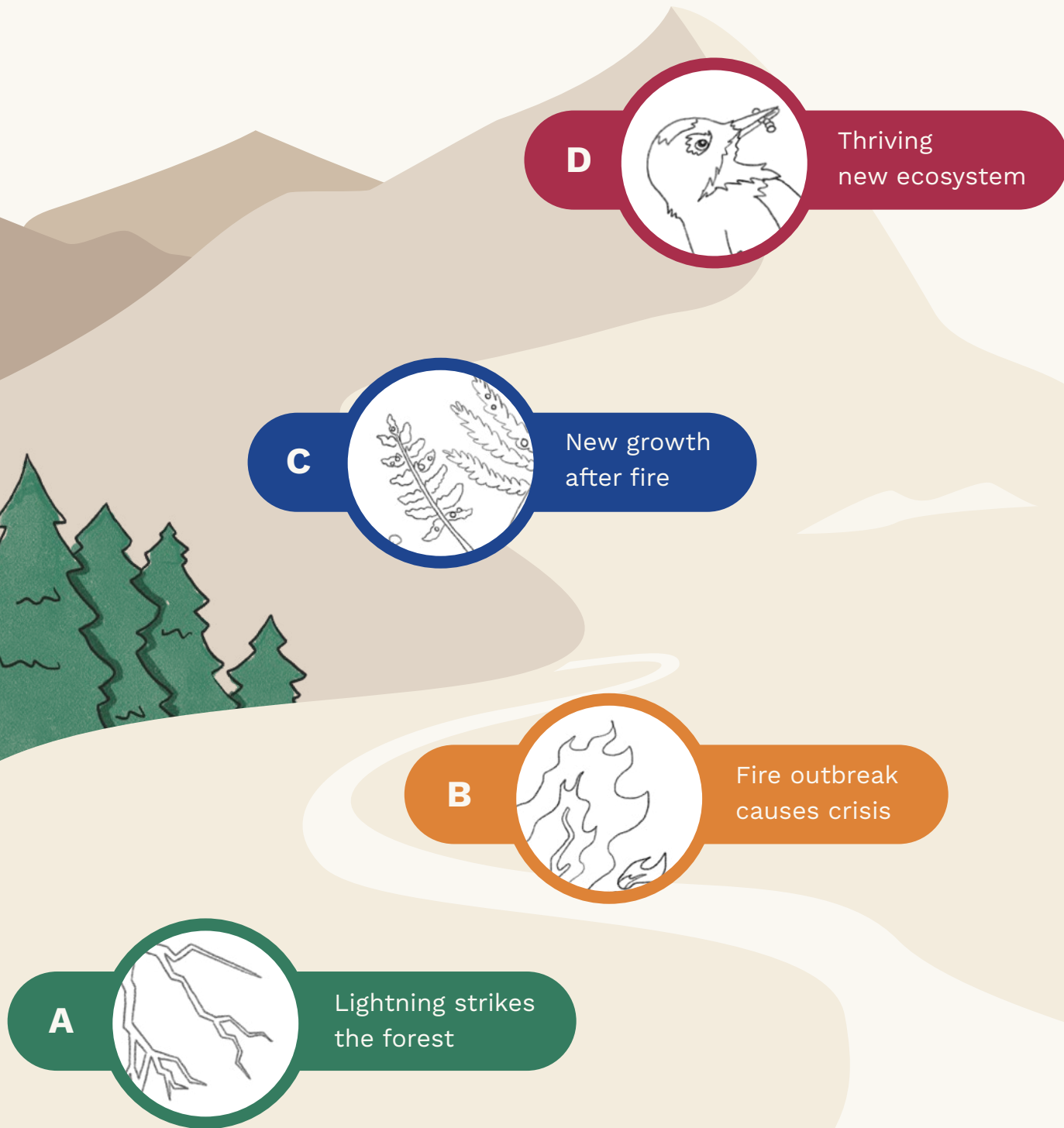
There is widespread awareness that the current education ecosystem is fundamentally flawed but so too is the new AI-enabled ecosystem.

C Standards set a better path

As growth reaches a saturation point, the limitations and harms of AI-enabled systems are resolved, and the promise of AI is finally real.

D Education emerges transformed

Incremental innovations serve to further entrench AI-enabled tech into the education ecosystem, showing us how AI-powered technology might support a different set of values and behaviors.



Transformation of any system is a complex process. We look to nature as a simple way to understand how things can rapidly evolve.

Think of a forest fire. Something sparks and all of a sudden the docile forest is up in flames. After a period of great upheaval, a new equilibrium sets in. Old species that are maladapted to the new environment perish away as a new ecosystem emerges.

Scenarios overview

Integrating the Four Futures transformation model with the variable conditions impacting the deployment of AI, we created the following four future scenarios.



Experimentation flames inequities

The AI edtech industry experiences rapid growth, albeit for a narrow set of applications. There's widespread excitement about the technology's impact on educational outcomes, but access is confined to schools and students with the most resources.



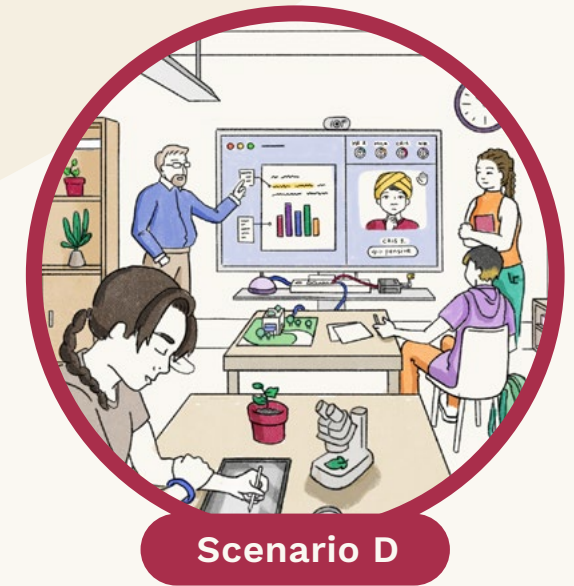
Industry calls for containment

AI ed-tech solutions abound, ranging from supporting administrative tasks to changing how students learn, and adoption grows steadily. However, the limitations and harms of the technology become widely apparent and there is public outcry for change.



Standards set a better path

Legislation and policies result in edtech solutions that are more fair, safe, and inclusive. New jobs emerge to support the ecosystem and ensure the quality of the solutions deployed, but the now-archaic academic standards and value system present challenges for educators and administrators.



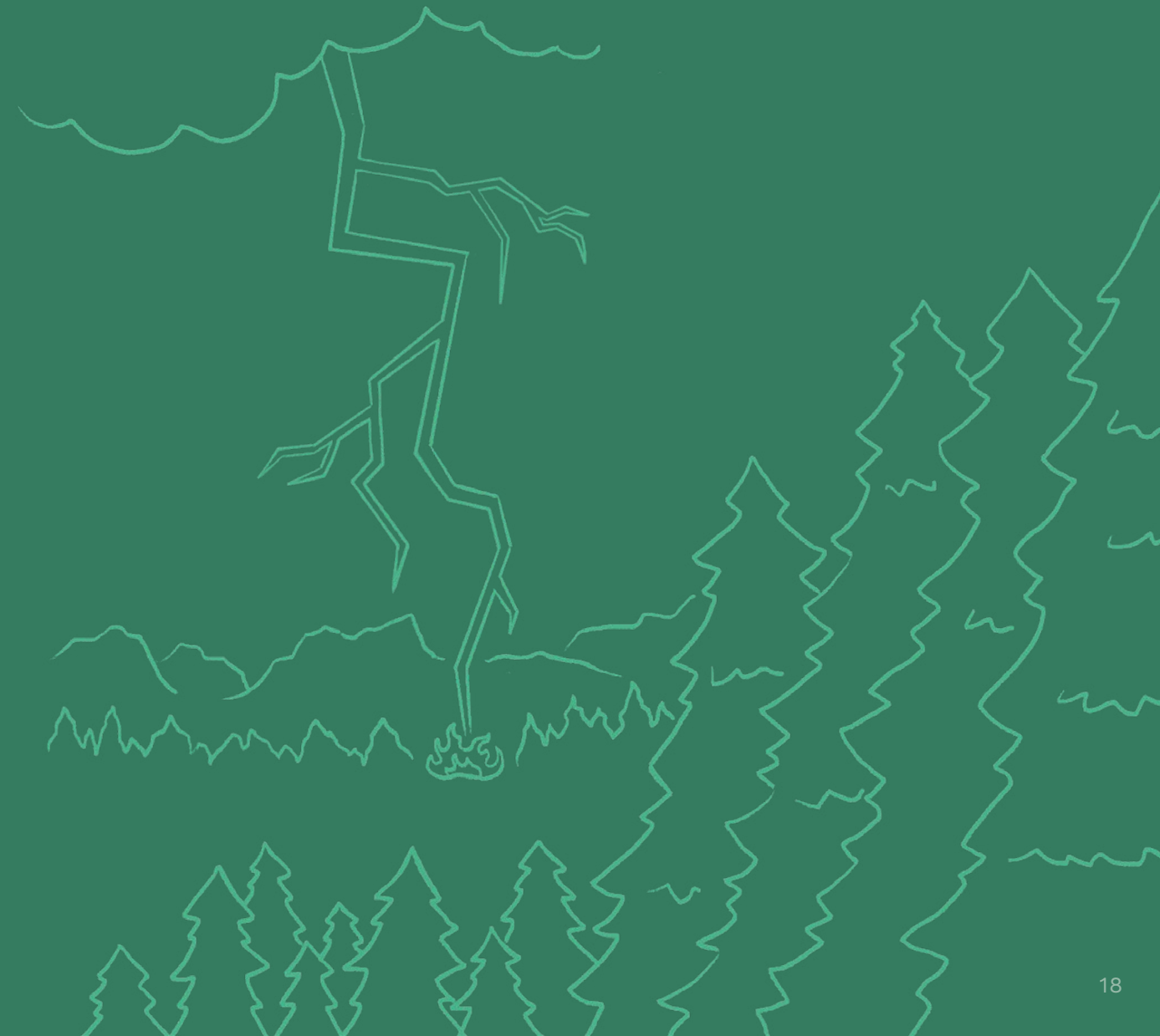
Education emerges transformed

Incremental innovations serve to further entrench AI-enabled tech into the education ecosystem, and an emerging set of values, pedagogies, and academic standards unlock a range of student outcomes and prepare them for the jobs of the future.



Experimentation flames inequities

AI ignites new technology products that start to sweep through the edtech landscape, resetting student learning and educator workflows. But like a healthy forest fire, only the areas it reaches reap the benefits.



Scenario A / Experimentation flames inequities

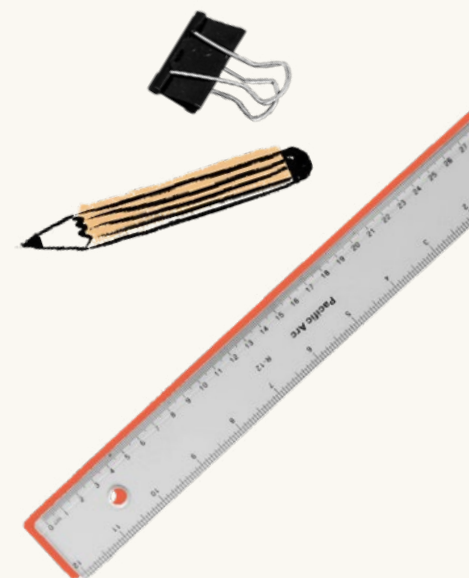
Fatima stared at the new headline: "AI Classroom Pilot at Charter School Raises Test Scores by 38%."

She sighed softly and furrowed her brow. No kidding, she thought. Her own public school district's tech and policy leads had been debating the costs, benefits, and risks of programs like this for eight months, with little progress made toward meaningfully bringing the technology into the district. Maybe this will push them to action, she thought, as their district consistently ranked lowest in test scores and grades.

She glanced at her daughter Safiyah, who held her homework up to the webcam on her computer screen to take a photo. Fatima had signed her up for the lighter "teaching assistant" version of Teachmate – the program Futurize Charter used in their classrooms – after the company presented a demo to the district Fatima worked for last year. While some local charter and private schools invested in the fully-integrated classroom-to-home version of Teachmate, Safiyah's public school had stricter rules on in-classroom tech.

Safiyah struggled throughout her early school years to maintain attention during class and repeatedly failed math. With nearly 30 students in the classroom, Fatima knew her daughter's teacher tried their best to provide individual attention with their limited time and resources. Teachers raised concerns over educator rankings and evaluations, as well as the risks of introducing more tech into classrooms where students already seemed glued to screens.

On an individual level, Teachmate had been a game-changer for Safiyah. With personalized support, she finally started to understand the concepts that once left her feeling lost and provided additional explanations using concepts from things Safiyah loves, like soccer. The program also includes progress reports and tips for Fatima and Safiyah's teacher on what works for her, helping them support Safiyah using customized, evidence-based teaching practices. She no longer feels lost and overwhelmed with her math work. Not only had it helped Safiyah understand the material better, but TeachMate also boosted her confidence and motivation and reduced arguments between her and Fatima about homework.



Scenario A / Experimentation flames inequities



However, TeachMate had its limitations. Fatima opted for a lower-tier, subject- and credit-based plan rather than the more expansive – and expensive – unlimited one. But as Safiyah moved up to middle school, she ran out of credits earlier each month. She kept asking Fatima to sign her up for other subjects, like History and Literature. Fatima debated with herself about upgrading to a two-subject plan, given the program's high cost, but eventually gave into Safiyah's nonstop requests. However, she canceled it after a month when Safiyah's teacher noticed startling inaccuracies in one of Safiyah's history papers as it appeared that TeachMate was drawing from inaccurate and revisionist data sources.

Safiyah also wasn't allowed to use the program during class. She sometimes struggled to adjust between the immediate help she received on at-home assignments and working through math problems independently with in-class assignments and tests. Still, Fatima hoped one day soon, her daughter's classmates might also benefit from the same personalized at-home support that changed her daughter's sense of her own possibilities.

Greater context and ethical considerations

As AI capabilities improve, new educational technology products emerge designed to support students in the classroom and at home. Free from stricter regulations and with access to funding, private and charter schools adopt these technologies and studies prove them to be effective in supporting teacher workflows and learning outcomes. Families with higher means adopt AI-powered ed-tech solutions to use at home, giving their children an edge in a tech-savvy and competitive society.

Federal and state governments hesitate to adopt AI-powered education tools in schools due to cost and regulations, restricting the use of them in many districts. In this bifurcated education landscape, some public-school teachers and students experiment with generic AI solutions and even prototype their own approaches. They reap some but not all the benefits experienced by students and educators with access to integrated and intentionally-developed education products.

Over time, the shortcomings of the datasets, language models, and algorithms that both generic and purpose-built programs use become more apparent as AI edtech reaches a larger population of students and teachers notice biases and inaccuracies.



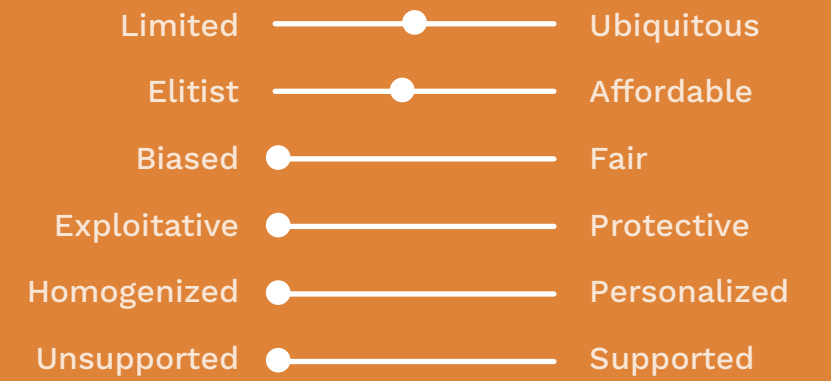
Companies rush to roll out solutions without fully considering who will have access, what information and language models they're using, and how these technologies will interplay in environments where not all students have access.



Schools and students with more resources benefit immensely from new technologies, widening equity gaps.



Education decision makers struggle to navigate the cost, benefit, and risk of different edtech solutions, or rush to adopt them without fully vetting them.



Industry calls for containment

As AI enabled solutions spread through the landscape, the industry realizes the harm that can be caused by immediate dangers like biased datasets and privacy violations. Advocates direct the energy of AI to needed areas.



Carina stopped as she walked down the hallway of Blue Creek Elementary, peering into a classroom full of students.

They busily alternated between computer screens and a box of electronic boards, wires, balsa wood, and mini solar panels as their club leader, Mx. Holden, looked on. Three years ago, Carina never would have imagined having the funding to support an extracurricular coding club. But a new grant matchmaking and management platform named Fundflow completely changed that.

At their small school near the reservation she'd grown up on, Carina wore many different hats outside her formal role, eager to support her students and maintain the vitality of their local community. Teachers and students knew they could come to her with ideas for programs and requests for resources and find a supportive partner in her.



Carina went through regular stretches where she spent several hours at home each night, staring at her laptop screen on her couch as she searched for grants. For each program application and progress report, she painstakingly copied the school's data and goals into various forms and formats. The process left her burnt out.

Their local school had tried various educational technology programs, from automated grading solutions and virtual, AI-powered classes intended to address local teaching shortages. But because these programs clearly hadn't been created with communities like theirs in mind, her school elected not to use them. While many kids now had

Scenario B / Industry calls for containment

access to reasonably reliable internet at home, half of the programs they tried could only deliver the experiences companies promised to kids with newer computers and high-speed connections. And as a school with a large population of Indigenous students, they always worked hard to incorporate their community's culture, values, and history into their teaching plans, which the content in these automated classes couldn't reflect. Additionally, high-profile lawsuits against some classroom-based programs using AI made many community members feel skeptical and resistant to programs that perpetuated racism and bias.

Carina was saddened by all of this and at times it outraged her that Blue Creek students would be "left behind" compared to students in districts that weren't as troubled by AI's limitations and harms and saw educational outcomes improve as they used the tech.

In response to rising protests against AI in the classroom and concerns around inequitable access, a non-profit foundation put out a call to educators to leverage AI to address other challenges they faced around equity. They'd invited educators and school leaders like her to join discussions and collaborative design workshops to share their needs and develop ideas.

It was through this process that the concept for FundFlow was born. It's a huge pain point. Schools rely on grants, donations, and volunteers to create great experiences for kids, but resource-constrained schools have the most difficulty getting the expertise and time required to obtain this support.

After a few product iterations, FundFlow practically ran itself. Teachers submit ideas about how they want to help students via a simple email, and the program locates the best-fit opportunities. Mx. Holden, a science teacher with little tech experience, developed the coding club concept with a simple request in FundFlow. It created a plan for

the school to follow based on data from other schools, matched them with specific funding opportunities, and even suggested a training program for Mx. Holden so they could learn how to lead the course. Carina just had to make a few minor changes and press "Send" to submit all the needed materials.

Carina looked across the classroom at the window, where a trio of students giggled. The solar experiments they'd coded wiggled and lit up as the sun hit the sensors. She snapped a photo and texted it to the FundFlow chatbot, who would incorporate it into the report back to funders.



Greater context and ethical considerations

Widespread rollouts of new AI edtech platforms in schools reveal unforeseen risks and result in legal challenges. Individuals file lawsuits and districts end their trials of AI-powered edtech platforms after investigations reveal these platforms to be built on biased, incomplete datasets and obscured practices of sharing student and teacher data with external entities. For example, a commonly used algorithm was shown to recommend lower-level material to students based on their demographic information rather than challenging them with more advanced material. The rosy picture of AI's potential is called into question and non-profit and tech policy groups call for legislative action.

In response, the edtech industry and NGO funders pivot their focus towards AI-enabled education workforce tools to help school leaders and administrators manage their daily tasks, responsibilities, and resources in a more efficient manner. They can now streamline the organization of school information, resources, grants, and funding sources, and more easily secure support to invest in their schools and maximize learning and extracurricular activities.



Solution developers that don't develop proactive auditing and accountability mechanisms face a series of reputational and financial risks.



Cross-sector collaborations help ensure AI-powered edtech solutions account for diverse needs and perspectives and avoid technosolutionism and saviorism mistakes of the past.



Solution developers look beyond classroom and tutoring AI use cases when considering product development efforts.



Standards set a better path

After the fire of AI application burns out, the landscape evolves from one of danger to one of fertility. Opportunities emerge for innovation, funding, and learning. Fortunately, with new mandates in place, these seedlings grow where they benefit all.



Mateo leaned back in his chair, hit “Render,” and watched as a 3D model of the atom appeared on his computer screen.

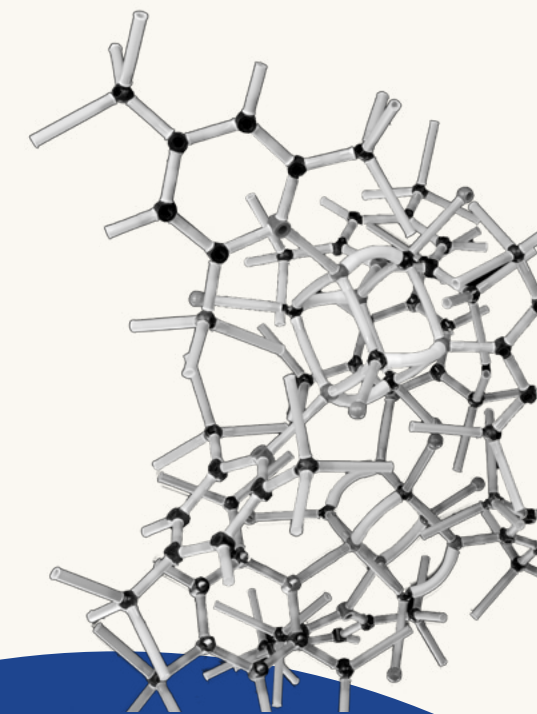
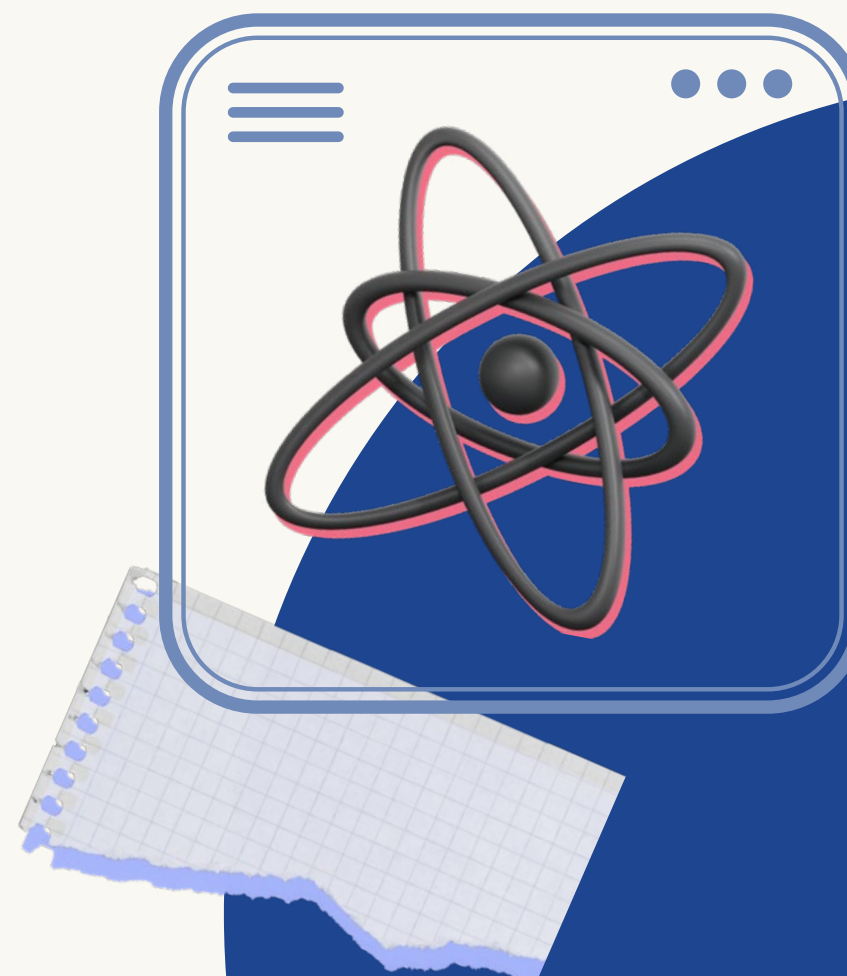
He spent a few minutes testing the virtual environment he created for Ms. Avasarala’s eighth grade chemistry class, making edits based on her feedback on the virtual experience, graphics, and visuals. He had been an immersive learning experience designer (ILXD) for over a year, a job he’d never heard of before discovering EdVenture. Growing up, Mateo spent most of his free time doodling and turning his drawings into animated non-fungible tokens. But with few opportunities available for human-generated design and art, he bounced between low-paid jobs like metaverse moderation and AI content auditing, flagging violent and inappropriate material.

After a national bill passed guaranteeing equitable access to AI-enabled edtech in schools and new requirements for responsible AI, schools nationwide rushed to vet and adopt different platforms that would meet their state and national standards for inclusion, diversity, and fairness. EdVenture avoided the pitfalls of purely automated content by developing a platform designed to support teachers and creators rather than replace them.

They paid artists and designers to build images, videos, and 3D assets in various creative styles, avoiding the identical look that proliferated across early immersive learning platforms. Kids quickly grew bored of these monotonous visuals after a couple of years. One company even experimented with licensing out popular social media creators’ virtual

avatars and voices to teach but shut it down just a few weeks later after one alternative school’s “Flat Earth Facts” lesson starring one of the top paid influencers in the world went viral. Teachers also voiced their frustration over the eroding relationship between them and their students, as kids believed facts delivered by influencers more than their teachers.

EdVenture’s approach intentionally sought balance among tech, teachers, and creators, realizing the role this would play in widespread adoption. When EdVenture pitched to schools, many teachers expressed trepidation at needing to learn a whole new program – when would they find the time to become VR designers and animators? EdVenture listened to that



Scenario C / Standards set a better path

feedback and tapped into creative communities to develop the ILXD role to support teachers and create job opportunity for thousands of creatives.

At EdVenture, Mateo felt rejuvenated. It also led him to discover his passion for science. Thanks to a multi-year grant, a city school hired him full-time to help teachers turn their lessons into immersive experiences using interactive videos, augmented reality (AR), virtual reality (VR), mixed reality (MR), and AI.

Over the summer, Mateo met with teachers as they prepped their curriculums so he could start planning and sourcing assets from artists on the platform, which made suggestions based on the teacher's lesson plans. As a school primarily serving Black and Latine students, leaders and teachers wanted to ensure that the renderings and contract artists they used represented their communities.

A message popped up from Ms. Avasarala. Thanks to EdVenture's community features, she'd just discovered a new activity uploaded by another teacher on the platform that she wanted to include in next week's lesson plan. When Mateo first met her this past summer, Ms. Avasarala was frustrated at the prospect of another school year where she struggled to compete for her students' attention. But this year – with relevant, personalized, and interactive content that catered to different learning styles – her classes' achievement rates soared, and twice as many students already signed up for next year's class.

Mateo thought back to his struggles in school. Who would have thought he'd choose to learn about science in his free time when he had failed chemistry? He smiled, happy he'd found his career path and excited to see more kids discover their passions and talents sooner.



Greater context and ethical considerations

In a landmark victory for education and tech equity advocates, a national bill is passed improving equitable access to AI-based education technology in schools and setting minimum standards based on responsible AI principles. Thanks to this new mandate and supporting subsidies and grants, edtech companies work to comply to the standards, schools across the country upgrade their technology, and school staff are provided with training opportunities. This activity leads to new companies and consulting roles, including AI edtech trainers, dataset designers focused on equity and inclusion, algorithm auditors, and edtech equity coaches.

As AI-enabled edtech becomes commonplace, the education landscape evolves. Private schools with more freedom to innovate radically reimagine curriculums, teaching experiences, and requirements. But public schools, still held to long-standing pedagogies and rigid academic standards, struggle to navigate the new demands and skills needed to deliver AI-enabled education experiences. In response, a new generation of edtech companies work to support teachers, building personalized educational content, remixing different activities, and keeping student attention and motivation high in a world saturated with immersive entertainment content and other distractions.



Legislation and national policies drive standards around AI in education while edtech solutions race to prove their commitment to equitable and ethical AI.



New roles emerge to ensure we don't repeat earlier mistakes around equitable AI edtech, including AI edtech trainers, dataset designers focused on equity and inclusion, algorithm auditors, and edtech equity coaches.



Educators and education systems struggle to navigate the new demands and skills needed to deliver education experiences that transcend standardized approaches and require immersive edutainment content.



Education emerges transformed

A state of balance allows AI technology to continue to bring innovations to the education sector, but in a positive, equitable, and inclusive way because of structures in place. Learners, educators, administrators, and ed tech companies all thrive in a world that continues to change.



Scenario D / Education emerges transformed

Nik locked their e-bike to the rack, plugging it into a charging cord connected to the solar panels mounted overhead.

As they walked towards the front door, they passed through the community garden. An older couple filled a bag with student-grown produce of berries and butter lettuce. The garden operated on a “pay what you can” system, which provided community members with access to affordable fresh produce. Nik remembered coming to the garden with their parent when the pilot first launched, which sparked their initial interest in food systems.

As they entered the school, they saw students lounging around mismatched furniture in an open space with colorfully decorated walls. Some peered intently at tablets with big headphones, while others wore VR glasses. Nik preferred to complete most of their asynchronous lessons at home, but some of their friends enjoyed coming into the learning space – or needed to, based on their internet access and strength at home. Their high school converted to a community lab model over the past few years, where half the classrooms transformed into experimentation spaces.

Nik slowed down as they passed the library’s Repair & Reuse Lab. The Tech section of the library loaned out equipment like VR glasses and sensors to students and community members. Nik glanced at the “New” board that charted new arrivals from donations or other community lab schools and repairs completed by the Tech Rejuvenation class. They always kept their eye out for new synthetic bio equipment and excitedly grinned when they saw a new AR microscope would be available soon.

Nik rushed to their lab room as a soft-sounding bell sounded in the hallway. They were working with their classmates on a project introducing sustainable agriculture requirements into building and retrofit codes and preparing to present at a government meeting next week. For this project, Nik worked with Mila, who was passionate about everything related to social sciences, and Cris, a data wiz. At first their team wasn’t getting along that well – but AI incorporated in their virtual meetings gave real-time guidance on how to read each other’s emotions and as a result be better collaborators. Nik joined their classmates and teacher, Mr. Rodriguez, at a large touchscreen that was modified by the Tech Rejuvenation class to extend its use.



Scenario D / Education emerges transformed

Mila and Cris examined the result of their latest simulation. Mila asked the screen to turn their findings into a presentation for the officials. Gathered around the screen, they gestured through the story to check the auto-generated visuals based on Cris' modeling, video testimonials from the community fathered by Mila, and environmental models and recommendations developed by Nik. Mr. Rodriguez annotated his comments directly on the screen. He was an expert at helping them connect their work to the bigger picture and navigate the political realities of moving their ideas forward.

Nik and their classmates often felt impatient about the slow pace of change when they worked on these government projects, but Mr. Rodriguez helped put things in perspective. When he was in high school, he shared, he would have been studying for a standardized test and never could have imagined being able to work on real-world problems with actual community data and presenting findings to government officials as a high schooler. Nik appreciated how Mr. Rodriguez challenged them to think critically and creatively and knew they would be better prepared when they joined the workforce, where they would work more closely with folks from other generations used to a different pace of change and communication style.

As the bell rang softly again, Nik and their classmates confirmed their following tasks before heading into the hallways. Nik walked towards their AI and Human Communication Arts class, which taught students how conversing with AI was different from interacting with people. Besides synthetic biology, the class was one of Nik's favorites. It helped them get along better with everyone in their life including their parents, a relationship with whom they had to work on to feel understood and loved.



Greater context and ethical considerations

Education has transformed remarkably to match shifting values and better prepare students for a complex and rapidly changing world. Across the nation, AI and analytics power a variety of use cases — improving teaching quality, streamlining administrative tasks, analyzing assessment data, and creating personalized student experiences. Instead of sitting at desks filling in standardized test bubbles, students work in exploratory labs and gathering spaces to contextualize what they learn and make in-person social connections. These places are open to the community, where participants engage with students on real-world examples and data sourced by AI on issues affecting them. Letter or number grades are replaced with personalized knowledge and experience graphs that represent each student's unique interests, skills, and needs and help them craft fulfilling paths.

As students from the first generation of these high-tech schools entered the workforce, researchers noticed a pattern of intergenerational tensions and misunderstandings. To address this, teachers and technologists worked together to develop Human and AI Communication Arts and Socio-Emotional Learning curriculums, helping students better differentiate between AI prompting language and human conversational cues. Other districts experiment with AI-free time to help students develop individual styles around writing and expression and hone social-emotional skills.



Education systems and classrooms shift to provide applicable, hands-on skills and prove their worth to students who can learn anything online.



The role of in-person learning is reimagined to provide opportunities to help students develop social and emotional learning (SEL) skills and navigate intergenerational collaboration.



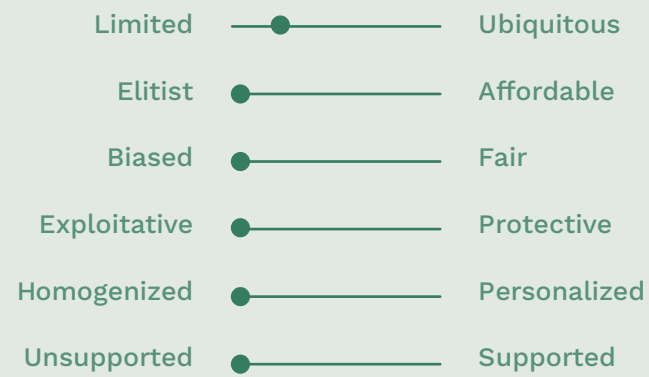
Schools serve not just kids but the surrounding community, creating a sense of place and connection that fosters a feeling of purpose and progress towards social justice goals.

Scenarios overview



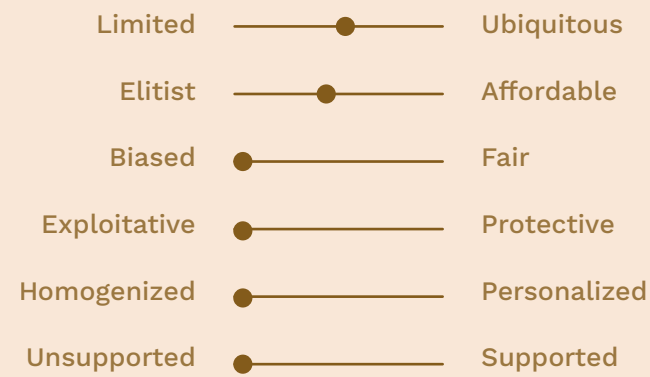
Scenario A

**Experimentation
flames inequities**



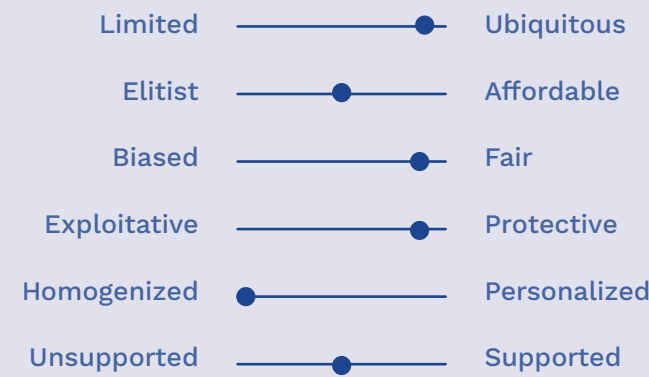
Scenario B

**Industry calls
for containment**



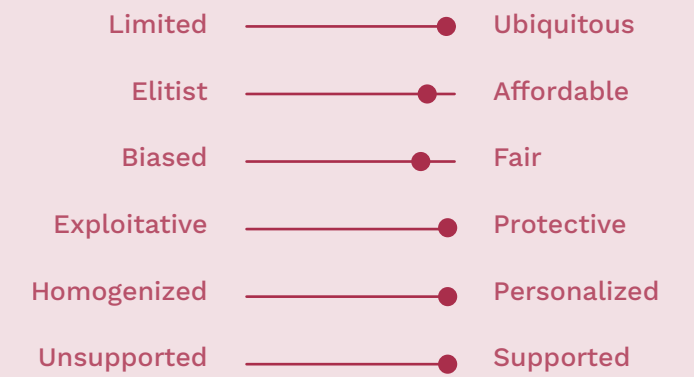
Scenario C

**Standards set
a better path**



Scenario D

**Education emerges
transformed**





Taking Action



[Imagining your AI future](#)

[Discussion guide](#)

[Getting started](#)



AI in education can feel both exciting to envision and complex to execute.

Get grounded by facilitating vibrant and honest conversations about your organization's future strategy. The rapid pace of development in AI can feel overwhelming, but the opportunity for transformational impact is real. Since every organization faces unique challenges, it's important to start conversations early to set strategy in a well-informed and inclusive manner.

New Roles

What other jobs might be needed to support the K-12 educational system? How might jobs at your organization need to evolve alongside AI?

Data Transparency

What information do you need about AI-powered edtech platforms to ensure they are minimizing bias and are transparent about their data use?

Equity

How can you ensure that AI is used in a way that promotes equity in education and doesn't exacerbate existing disparities?

Inclusion

What are the main challenges in implementing inclusive processes, specifically in the education sector?

Internal leaders and stakeholders

Organizations will need a comprehensive AI strategy that is driven by engaged leadership at every level. To ensure that all voices are heard across functions, consider bringing together internal stakeholders in a set of collaborative workshops to address key challenges, opportunities, and concerns.



Key objectives

- ◆ Identify unique organizational risks and opportunities related to working with AI
- ◆ Clarify how the organization's business or operating model will need to evolve to stay competitive in the age of AI
- ◆ Plan for the comprehensive transition of roles that may be replaced, augmented, or newly emerge as a result of new AI tools
- ◆ Strategize how product or service offerings might change to address transitional and emerging needs
- ◆ Envision specific AI-in-education scenarios for the future that can be used as a north star to align and inspire leaders and team members working on new products and services

External stakeholders and community

The transformative effect of AI will be felt across the different communities your organization serves, the partners that you work with, and the civic environment in which you operate. To ensure that your organization is developing its AI strategy with these contexts in mind, consider addressing the following objectives.

Key objectives

- ◆ Conduct primary research with the populations you serve to better understand their unique needs within the context of AI-driven experiences
- ◆ Develop co-design workshops or practices that include community members and leaders in the development of new products and services
- ◆ Identify strategic partnerships with similar organizations that can offer mutual benefits for strategic investments in technology
- ◆ Engage with civic and education leaders to understand the emerging legal, regulatory, and legislative environment surrounding the deployment of AI in education



Start new conversations to envision your AI future.

Bring one or more of the discussion questions included here into your next meeting to initiate critical conversations with your leaders, stakeholders, and broader community.

Stakeholders

The primary characters in the scenarios are a concerned parent, school administrator, content creator, and high school student. Teachers show up in the scenarios as well. Whose perspective might be missing and what might their experience be?

Strategy

Looking at the list of variable conditions, which conditions are most important to consider given your work and strategic priorities? What conditions, if any, are missing from the list?

Consequences

The scenarios describe various causes and effects. For example, in the last scenario, students are so used to working with AI agents that their ability to interact effectively with humans diminishes. What other effects might occur that weren't fully explored in the scenarios?

Applications

There are many applications of AI in education. Which applications have the highest potential to positively affect educational outcomes? Which applications will likely come to fruition in the near term? Long-term? Why?

Students

The scenarios touch upon students' struggle to maintain motivation and focus, especially in a world where they are inundated with immersive content and get bored easily. What other student needs must we consider?

Administrators & Educators

Administrators and educators will need support to help them stay current with technology advancements, and they might resist accepting assessment results and changing their teaching practices. What other needs should we be considering?

Discussion guide

Standards & Values

Personalized learning will require a new set of values, pedagogies, academic standards, and practices to take hold. What barriers will likely exist along the way? And what educational outcomes (e.g. cognitive, affective, social-emotional) do we really want and need to be striving towards?

Equity

AI-powered edtech solutions risk widening achievement and equity gaps between students, which will start to show up in grades and test scores as some students use edtech solutions at home. How does your work intersect with equity and access?

Data Transparency

Tracking student, teacher, and school data can be helpful or harmful, depending on how it's used and who has access to it. What structures need to be put in place to ensure AI-powered education products or services are transparent about how they use assessment data and avoid perpetuating biases and discriminatory practices?

Managing Risk

In the absence of regulation, it will be difficult to understand a technology's compliance with responsible principles. How can edtech companies be transparent about the inherent risks of their products, and how can funders and school systems make informed choices as to which technologies to adopt?

New Roles

The third scenario describes new jobs that will be needed to ensure AI is trustworthy – such as AI edtech trainers, dataset designers focused on equity and inclusion, algorithm auditors, and edtech equity coaches. What other jobs might be needed to support the K-12 educational system? How might jobs at your organization need to evolve?

Inclusion

Tools and programs designed without meaningful input from the groups who will use them often result in well-intentioned solutions that don't serve the areas of greatest impact and need. What are the main challenges in implementing inclusive processes, specifically in the education sector?



Ready to chart the path for your organization's AI future?

These explorations were created by Artefact, a visionary design firm that helps leaders create better futures for people, business, and society. Our work intersects education, healthcare, social impact, and emerging technology spaces. By approaching the toughest challenges with equal parts creativity and pragmatism we deliver impact that drives lasting change.

Get connected with our team at info@artefactgroup.com to discuss your unique challenges and learn about how Artefact can help you understand AI's impact on your organization, foster resilience across your team and stakeholders, and strategically evolve your product or service offerings to thrive in the emerging new environment.



Thank you to all the contributors to this work including Neeti Sanyal, Kelly Neuner, Max West, Julia Anderson, Mahlon Houk, Jenny Lin, Matthew Jordan, and Sabrina Boler.

Illustrations of mule deer, horntail wasp, fireweed, aloe ferox, giant sequoia, pixie cup fungi, Australian firehawks, sword fern, echidna, morel mushrooms, jack pine cone, Baker's wild hollyhock, fire-chasing beetles, olive-sided flycatchers, and Venus fly traps represent species of plants and animals resilient to changes brought about by wildfires.





Better futures, by design.

artefactgroup.com

