A-Street

A-Street K-12 Market Overview

March 2023

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This research is co-funded by the Bill & Melinda Gates Foundation. The findings and conclusions contained within are those of the authors and do not necessarily reflect positions or policies of the Bill & Melinda Gates Foundation.

Sources

Secondary Sources

- Education Week
- Analyst reports (BMO, Morgan Stanley, Wells Fargo)
- CapIQ
- National Center for Education Statistics (NCES)
- EdReports
- Consortium for School Networking (CoSN)
- Survey by State Educational Technology Directors Association (SETDA)
- LinkedIn
- Crunchbase
- Common Sense Media
- Digest of Education Statistics
- Education Data Initiative
- Georgetown Future Ed
- Texas Education Agency
- Office of Elementary and Secondary Education
- Gartner
- IBIS World
- NAEP administration
- Company websites
- U.S. Census
- Institute of Education Sciences
- National Bureau of Economic Research
- Harvard Kennedy School
- MIT
- Forbes
- Institute of Education Sciences
- Brookings Institution
- Zearn
- WestEd
- Curriculum HQ
- Wall Street Journal
- The New York Times
- NCES
- US DOE ARPA Fact Sheet
- MDR
- EdWeek
- Annenberg Institute for School Reform at Brown University
- American Association of Colleges for Teacher Education (AACTE)
- U.S. Department of Education
- Wayback Machine
- Teachers Pay Teachers
- LISTedTECH
- Dealogic
- Science of Reading: The Podcast
- APM reports
- Company filings and presentations
- Merrimack College Teacher Survey (N=1324)
- Pitchbook
- SPS
- Economic Policy Institute
- K-12Dive
- US Bureau of Labor Statistics
- GivingUSA
- World Economic Forum
- Good Jobs Project
- Emsi Burning Glass
- O*NET
- COVID K-12 survey
- Harvard University Center for Education Policy Research
- American Progress
- U.S. Department of Education Administration for Children & Families

Message to the reader

Dear Friends of A-Street,

For a mix of reasons troubling and promising, we stand at a powerful inflection in the American PK-12 landscape. In many respects, the 2022-23 school year has been one of finding the new normal for students, teachers and schools. In that new normal, schools of all types throughout the fifty states are contending with stubbornly challenging student performance trends and an underlying fragility of the student that should give us all pause. By all accounts - anecdotal and empirical - working conditions for teachers have only deteriorated even as the stakes for our communities and economy have grown in consequence.

At the same time, we at A-Street cannot help but acknowledge and express optimism for important milestones in the effort to scale high quality and coherent tools in classrooms that improve student outcomes and teacher effectiveness. The buildout of digital infrastructure necessary to leverage new solutions in schools and for teachers has continued steadily since the pandemic. Increasingly, access to devices and the requisite bandwidth are not the problem in schools. Further, in just the last hundred days, the promise of generative artificial intelligence as an active ingredient to make teachers more effective and learning more individualized feels palpable. Relatedly and most importantly, the demand signals from end users - students, teachers, and parents - for high quality and coherent instructional solutions are only growing stronger.

Against this backdrop, A-Street set out to sharpen our understanding of key trends and dynamics in the PreK-12 marketplace. Since our founding two years ago, our goal has been to invest in teams and tools that can scale access to high quality and coherent solutions across American classrooms and in so doing bend the curve of how students learn, how educators work and how investors deploy capital.

The enclosed research centered on four key questions:

- What are the key quality trendlines in PK-12 instructional materials, especially those focused on the core?
- What are the latest trendlines for private equity and philanthropic investing in PK-12 instructional tools and solutions, and what might those trends predict about quality moving forward?
- Where are we in the innovation roadmap in PK-12 given the deep possibilities for AI as applied to teaching and learning?
- What are the key frictions in the marketplace? What work remains both for philanthropy and private equity to better manage those tensions and to elevate more clearly the voice of the student and educator?

We hope you will find the attached analysis as interesting and useful as we do in readying for the work ahead. In sharing, A-Street is pleased to express gratitude to the Bill & Melinda Gates Foundation for their partnership in advancing this important research.

Sincerely,

Tom Kuo & Marc Sternberg
Co-Founders, A-Street

AGENDA

Impact opportunity overview

Role of for-profit in addressing opportunity

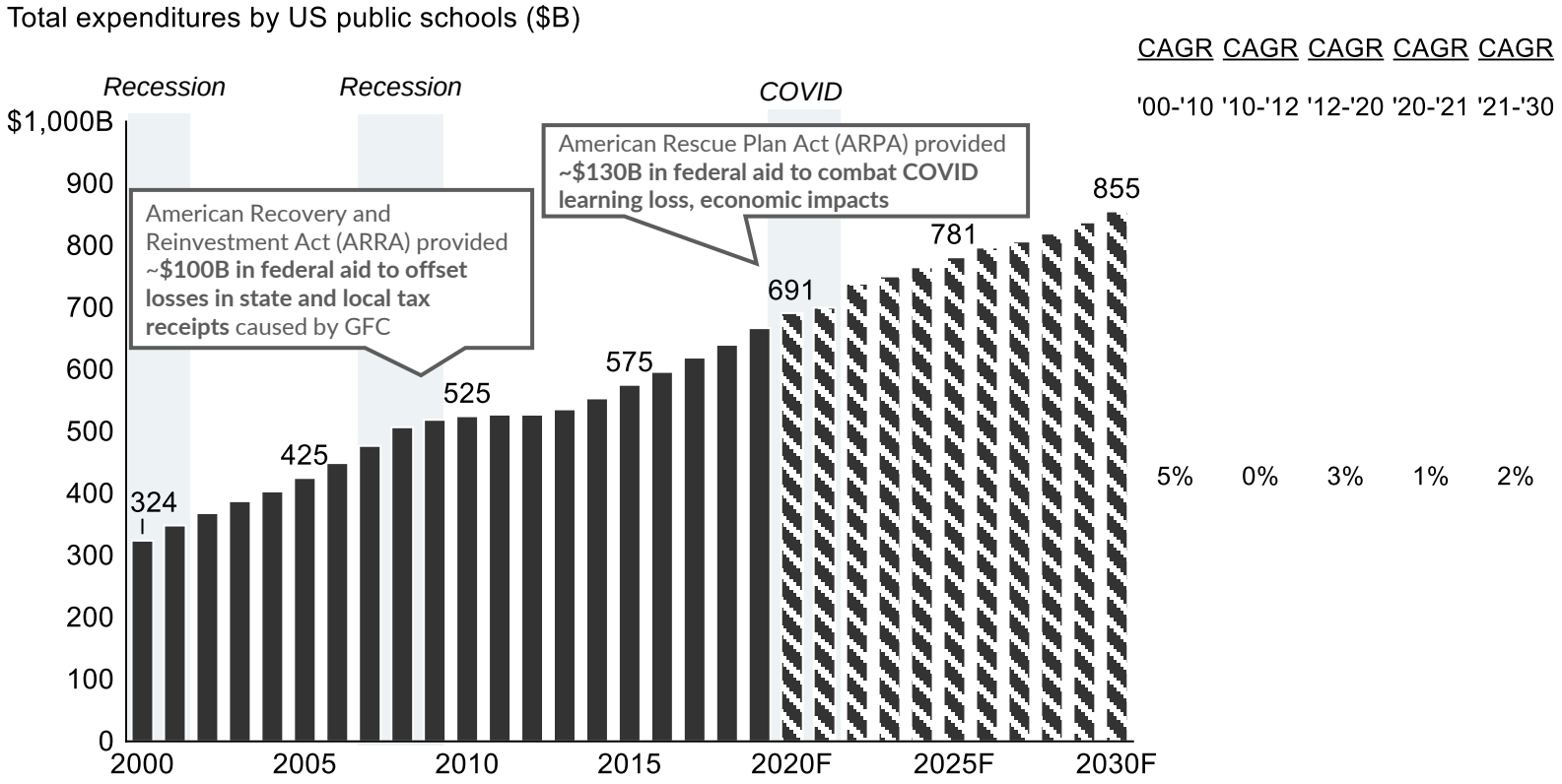
Market frictions in education

Role of philanthropy

PreK-12 market is large and features stable funding sources

IMPACT OPPORTUNITY | MARKET GROWTH

U.S. public school spend has grown steadily since 2000 and is expected to continue increasing through 2030



Note: Latest available data from 2021 NCES report; Data does not include capital outlay expenditures directed towards facilities
Source: NCES, US DOEd

Federal funding tends to offset losses caused by recessions

- Federal funding typically accounts for **~8% (~$55B) of annual funding in years with no recessionary impact** ('15-'19)
  - **Rose to 13% during GFC** with remainder coming from state and local tax receipts
- Unprecedented **~$190B in federal emergency relief** was invested in addressing **high-levels of COVID-19 learning loss**
- ARRA federal aid provided **backstop for losses at state, local level** during GFC
  - Allowed districts to nearly **maintain planned expenditures with minimal disruption**

*"**ARPA provided an embarrassment of riches** to help public schools deal with the challenges of COVID."*
Assistant Superintendent, Public school district #1

*"**Our overall funding wasn't really affected by the GFC or COVID-19**. Especially for ARPA, we're seeing that some schools may run out of things to spend on."*
Director of Tech Integration, Public school district #4

The current state of education is inadequately preparing the next generation for shifts in workforce expectations

IMPACT OPPORTUNITY | OVERVIEW

There is a growing need for a highly skilled and paid workforce

97 million

jobs are likely to be created in the **fields of the future**

~3.5 times

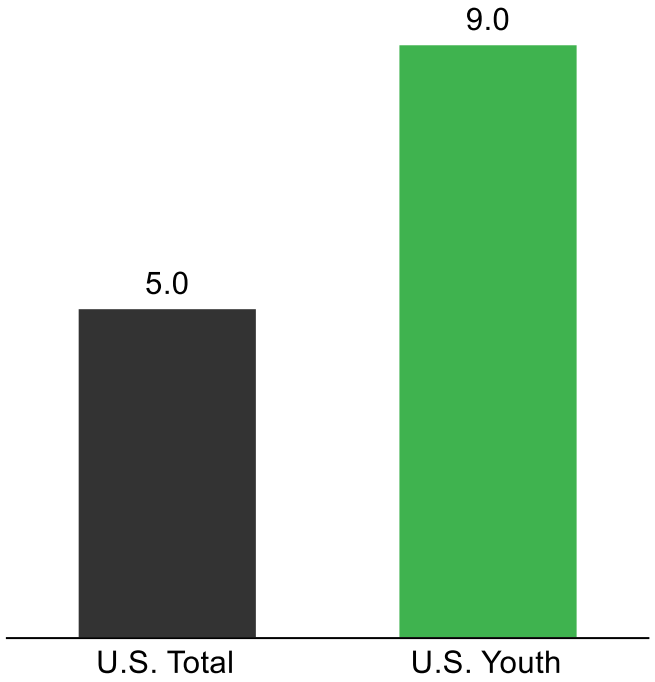
as likely to require high skills

~6 times

as likely to pay over $100,000 a year

Our youth appear ill-prepared for these changes

U.S. Unemployment rate (%)



Education is partially responsible for the gap in preparation for our youth

Programs are **disconnected** from the **outside world**

Students lack opportunities for **real-world work experience**

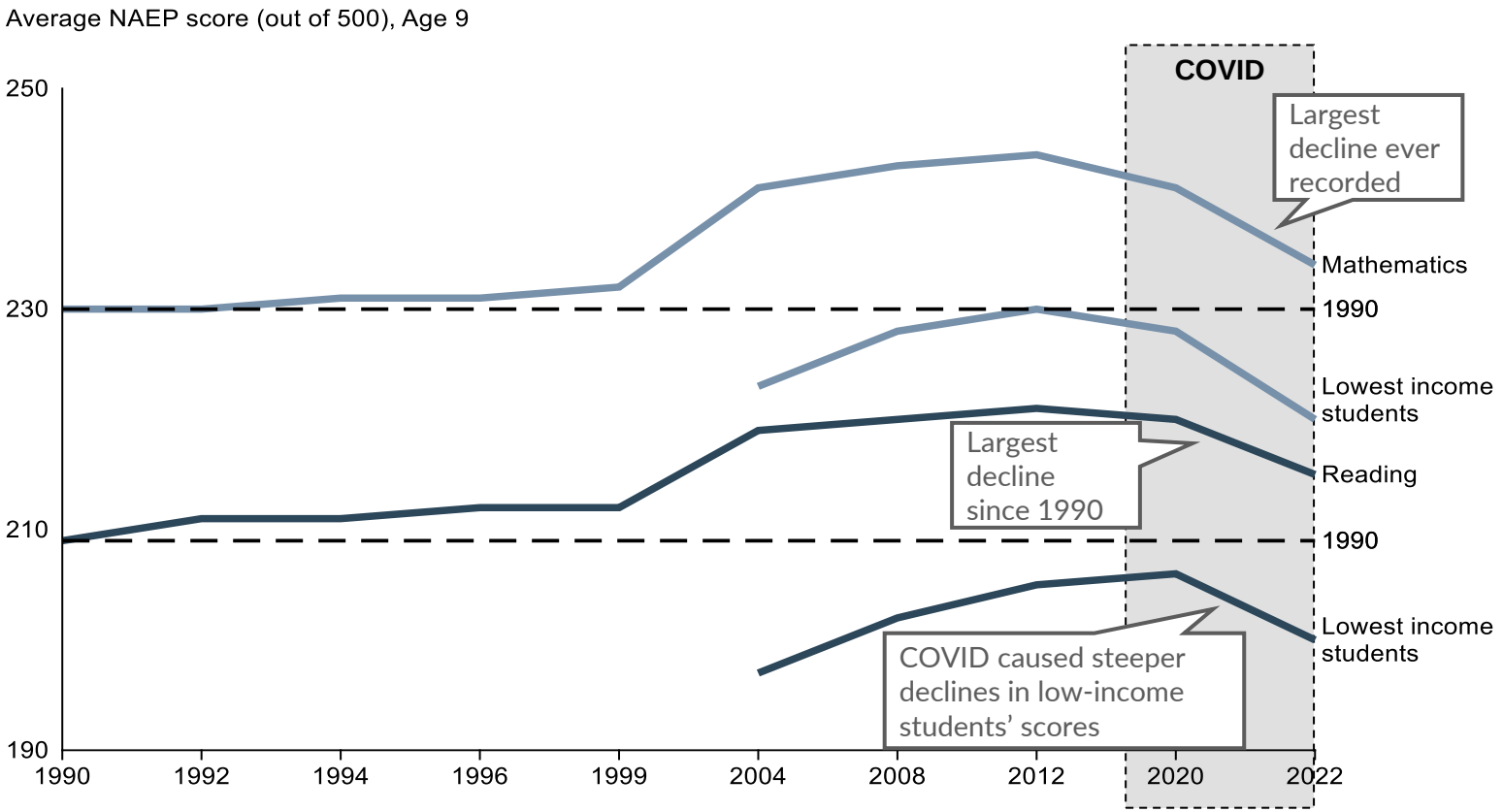
Only 18% of public college freshmen will graduate and immediately **earn a living wage**

Note: Analysis of graduates earning a living wage only considers those consistently employed in the state where the university system is based. Living wage calculated as of 2020 by MIT Living Wage Project.
Source: Emsi Burning Glass LTM ending July 2021 job postings; US Bureau of Labor Statistics projection data 2020 to 2030; O*NET; The Good Jobs Project; MIT Living Wage Project; US Bureau of Labor Statistics Job Openings; World Economic Forum "The Future of Jobs" 2020 report projecting numbers and jobs for 2020 to 2025, US Bureau of Labor Statistics (Sept 21)

PreK-12 is in a particularly challenging moment post COVID with NAEP scores at lowest in decades & limited progress closing the gap

IMPACT OPPORTUNITY | NAEP SCORES

NAEP scores for both reading & math have declined over the past decade, with accelerating declines during COVID-19 hitting low-income students hardest



Proficiency in critical subjects is lowest among Black students

	Overall pop.	Most impacted demographic
Math	24%	8%
	% of total US 12th graders proficient in math	*% of Black US 12th graders proficient in math*
Reading	37%	17%
	% of total US 12th graders proficient in reading	*% of Black US 12th graders proficient in reading*

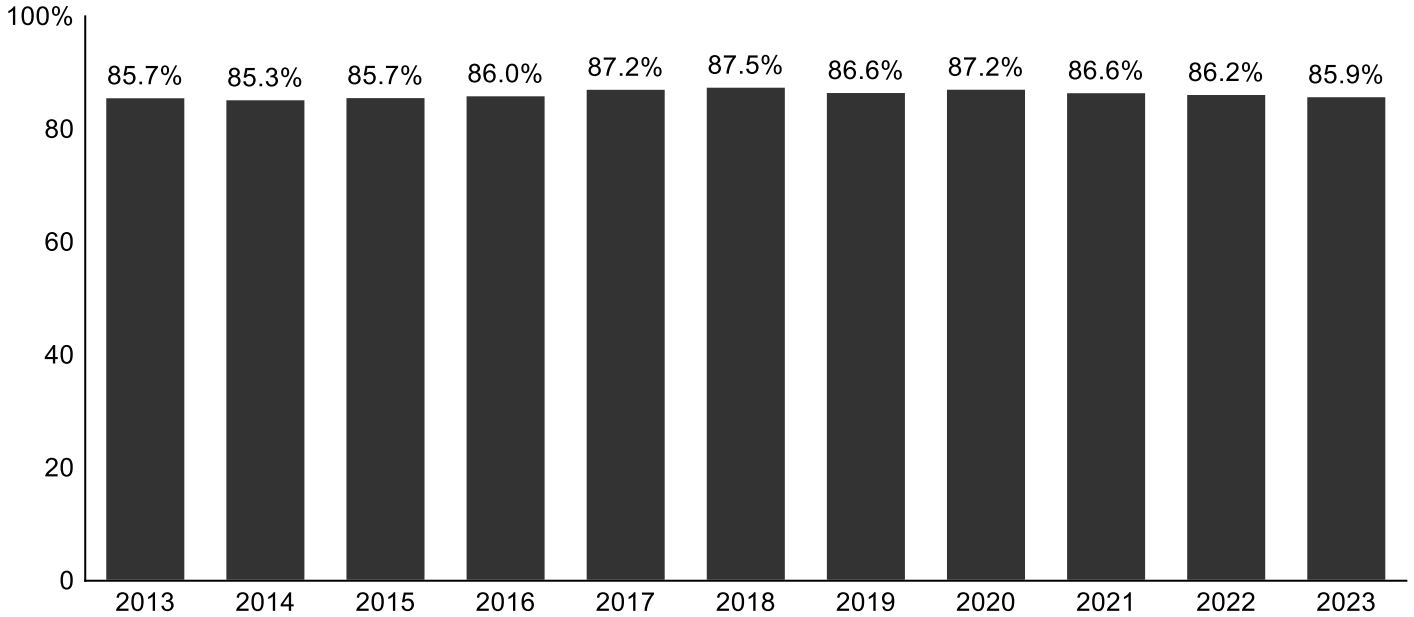
Note: Average scale scores and percentages for age 9 long-term trend mathematics and reading, by all students [TOTAL] and jurisdiction: 2022, 2020, 2012, 2008, 2004, 1999, 1996, 1994, 1992, 1990; Lowest income students are determined as those eligible for free lunch under National School Lunch Program; Proficiency figures are as of 2019. Source: NAEP Data Explorer; NAEP administration

US high school graduation is stagnant & has shown little sign of improving; major disparities in completion in marginalized communities

IMPACT OPPORTUNITY | GRADUATION

Consistently over the last 10 years, only ~85% of US public high schoolers graduate

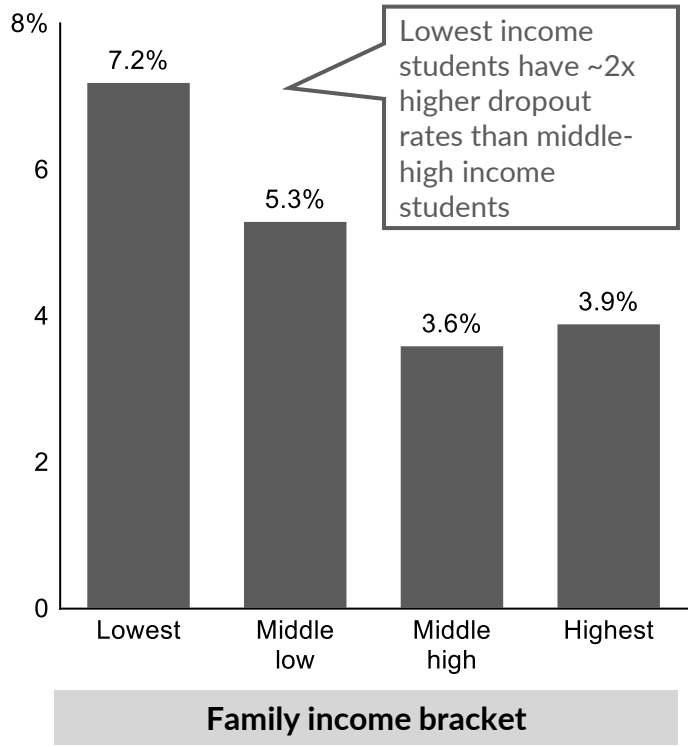
Total number of US public high school graduates by school year
(Projections based on '13 census; figures updated in 2021 and account for COVID impacts)



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Graduates (M)	3.2	3.2	3.2	3.3	3.3	3.3	3.3	3.3	3.3	3.4	3.3

Dropout rates are worst among the lowest income students

% of 16- to 24- year olds who are not enrolled in HS and lack a HS credential (status dropout rate, 2018)



Note: Graduation figures are projected by NCES based on 2013 census data; figures most recently refreshed in 2021 and account for impacts of COVID; Enrollment figures used in calculating graduation rates are projected for 2021 onwards by NCES
Source: NCES

There are five challenges across student, teacher, & administrator workflows which companies and their investors can impact

IMPACT OPPORTUNITY | CORE CHALLENGES

System challenges

Not exhaustive	PreK-12 workflows					
	District / school ops & strat. development	**Staff recruitment & development**	**Lesson planning and prep**	**Classroom learning**	**Assessment and analytics**	**Enrichment and student support**
Key workflow activities	• Choosing curriculum design, implementation • Engaging the community • Managing student data	• Setting headcount, budget • Onboarding, retaining talent • Developing skills	• Identifying learning objectives • Determining materials needed • Accommodations for varying student needs	• Providing direct instruction • Facilitating group activities, discussions • Providing experiential learning	• Evaluating students via formative, summative assessments • Using data to improve teaching, identify student needs	• Counseling and mental health services • Incorporating SEL into curriculum • Collaborating with outside organizations
Key stake-holders	• Administrators	• Administrators • Teachers	• Teachers	• Teachers • Students	• Teachers	• Administrators • Teachers • Students
Key system complexity and short-comings	• Complex data management / back-end integrations • Stakeholder mgmt. (e.g., parent comms) • Safety / security	• Teacher quality issues • Teacher / principal shortage, retention • Broader staff shortages (e.g., bus drivers)	• Juggling multiple curriculum tools/ resources (incoherence) • Cumbersome administrative processes	• Low quality curriculum • HQ curriculum often harder to implement • Incoherence across content	• Incoherence between assessments and materials • Interpretation and leveraging of data • Excessive assessment frequency	• Diminishing student health and well-being

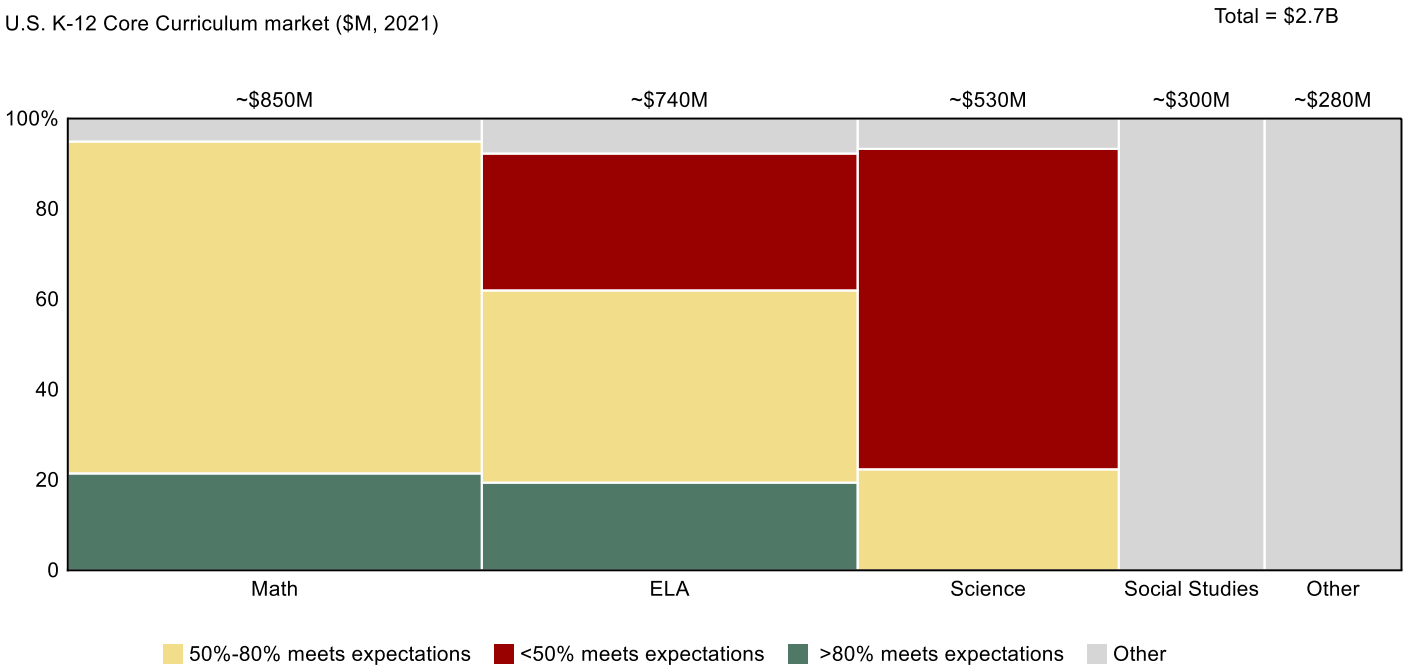
Challenges

1. **Limited use of high-quality curriculum and data**
2. **Incoherence across materials, tools, & platforms**
3. **Staff workforce quality & shortage**
4. **Diminishing student health and well-being**
5. **Cumbersome existing admin processes**

Content rated as “high quality” has low penetration today and can be difficult to implement

IMPACT OPPORTUNITY | QUALITY

Estimates suggest <20% of annual core curriculum spend is on products rated green by EdReports



High quality instructional materials (HQIM) face barriers to share gain

- **Buyers most concerned with standards alignment,** legacy players typically adhere
- **High quality curriculum has a steeper learning curve** so it’s more challenging to roll out with fidelity; requires additional teacher PD
- HQIM often perceived as being **more difficult to use** and could result in **lower student engagement**
- **Procurement process often complex** especially for large districts with variety of decision makers; **cross-sell platform plays from large players can offer savings**

“When renewing core curriculum, ***it's going to take teachers about 3 years to get good at teaching new traditional material. I can see it taking longer if the materials are more rigorous.”***

Chief Business Officer, Public school district #5

“We select our core materials primarily based on ***how well it aligns with our state standards.”***

Asst. Superintendent, Public school district #3

Note: Quality defined as proportion of publisher curriculum in last seven years scoring “meets expectations” on alignment according to EdReports.org; EdReports only evaluates Math, ELA, and Science
Source: EdWeek, EdReports, Gartner, LISTedTECH, NCES, Analyst reports (BMO, Morgan Stanley, Wells Fargo), Company filings and presentations

Teachers are typically juggling multiple products on top of core making the experience complex

IMPACT OPPORTUNITY | COHERENCE

Math / ELA especially complex given emphasis on assessments, supplemental needed to support core

Subject	Average K-5 product stack		Example vendors used
Math	• Core curriculum • 3 supplemental • 1 assessment	60% of teachers / admin report using 3+ supp math tools alongside core & assessment	GREAT MINDS, IXL, ZEARN, i-Ready, dreambox LEARNING
ELA	• Core curriculum • 3 supplemental • 1 assessment	Average number of ELA products used by teachers is 3.6	McGraw Hill, RENAISSANCE Accelerated Reader, Lexia, Achieve3000, RENAISSANCE Star Assessments
Science	• Core curriculum • 2 supplemental	Fewer supplemental options available, assessments less likely in this cohort	STEMscopes THE LEADER IN STEM EDUCATION, BrainPOP, MYSTERY science

~45% of teachers

reported feeling unfamiliar with some of the learning tools *they had at their disposal*

Source: Industry participant interviews; COVID K-12 survey

COVID increased need for digital tools to fill in learning gaps that core couldn't cover at the time

- Availability of **additional federal funding gave districts the spending flexibility to try many new tools to address gaps in core** created by remote learning environments
- Combination of rapid shift to digital, accelerated implementation timelines, and increase in new tools **worsened incoherence for many teachers**
  - Teachers often have to **juggle multiple products** within a single class
  - **Students also impacted** as the **learning experience could become disjointed**
- Curriculum DMs and teachers cite **increasing desire for integration**

*"**We built a substantial tech stack and spent 30-40% more on the digital side thanks to the federal funding – supplemental content, PDF editors, productivity tools**. The truth is not all of it is good and a lot of them don't really work with each other, so we'll likely cut here when the funding gets tighter."*

Director of Technology Integration, Public school district #4

*"Lots of teachers are trying to **manage a Cheesecake Factory menu of teaching tools** and even if the vendor says it's all integrated, the **truth is it's far from where we want it to be**. The **future has to be about how we consolidate all that in a meaningful way**."*

Chief Revenue Officer, Curriculum publisher #2

*"We were lucky because we adopted a new digital-ready core curriculum right before COVID, but I saw other districts who **started to see bigger learning gaps because their core was outdated, and they needed supplemental tools to plug those gaps**."*

Assistant Superintendent, Public school district #1

Teacher shortages have been compacted by COVID and more severely impact schools serving lower income students

IMPACT OPPORTUNITY | TEACHER SHORTAGE

Vacancies and underqualified teachers are a pain point for many schools

~200k+

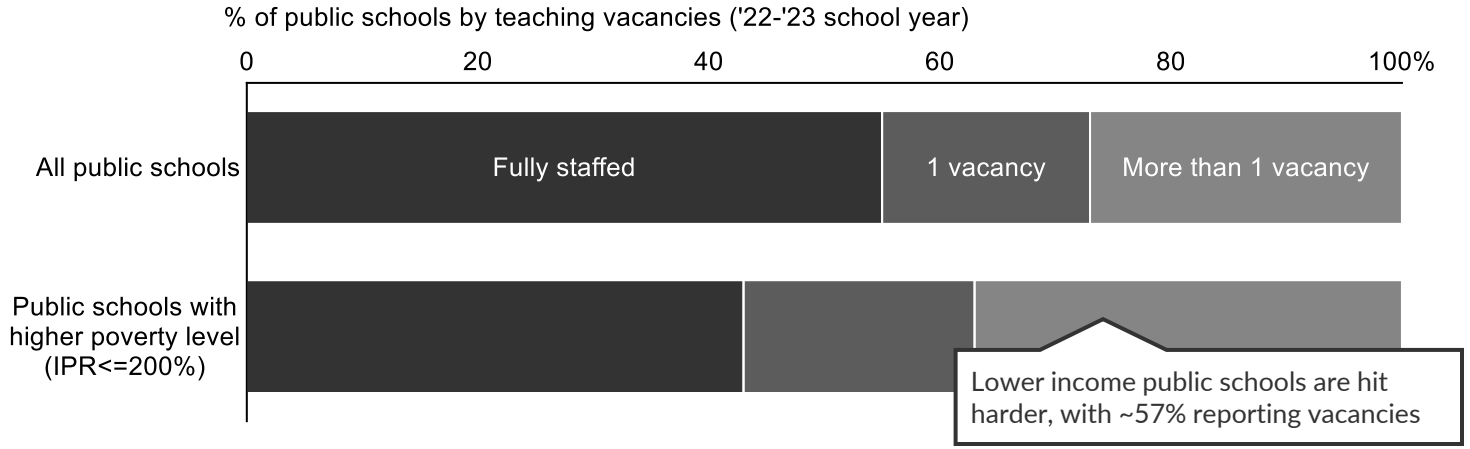
Estimated national teaching vacancies and underqualified teachers

- **61% of schools** with vacancies reported **COVID-19** to be a cause of increased staff shortages
- Challenges to filling vacant positions are overwhelmingly led by a **paucity of adequate candidates**
  - **69%** of respondents indicate they have **too few candidates** applying for open teaching positions
  - **63%** of respondents report a **lack of qualified candidates** applying for open teaching positions

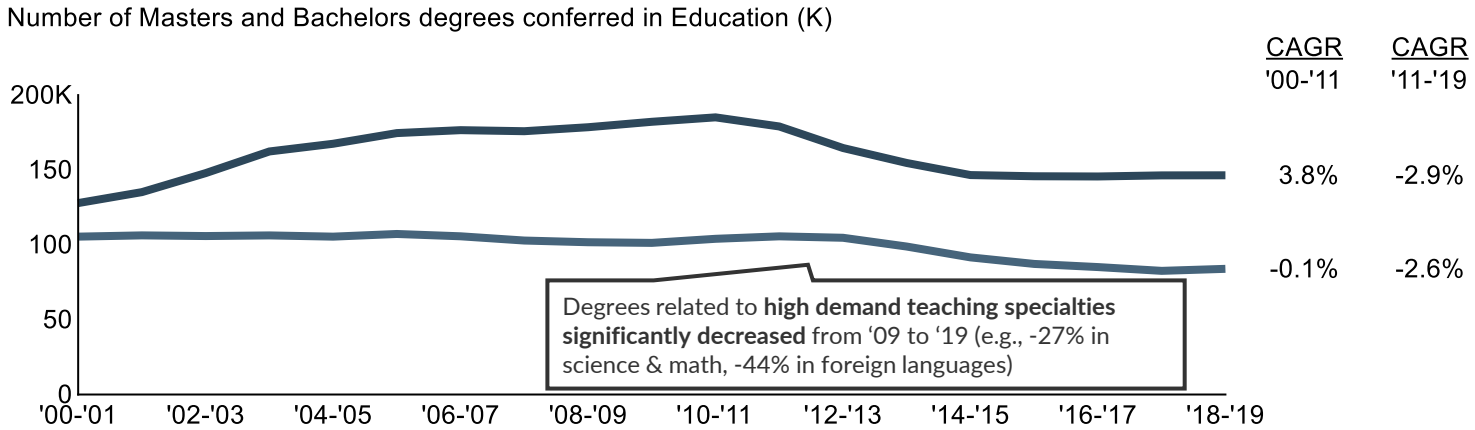
*"We **still don't have a fully staffed school.** We have to pay teachers to do extra sessions."*
Director of Technology Integration, Public school district #4

~45% of public schools report teaching vacancies, partially fueled by fewer people graduating with degrees in education over time

'22-'23 vacancies



Historical trend

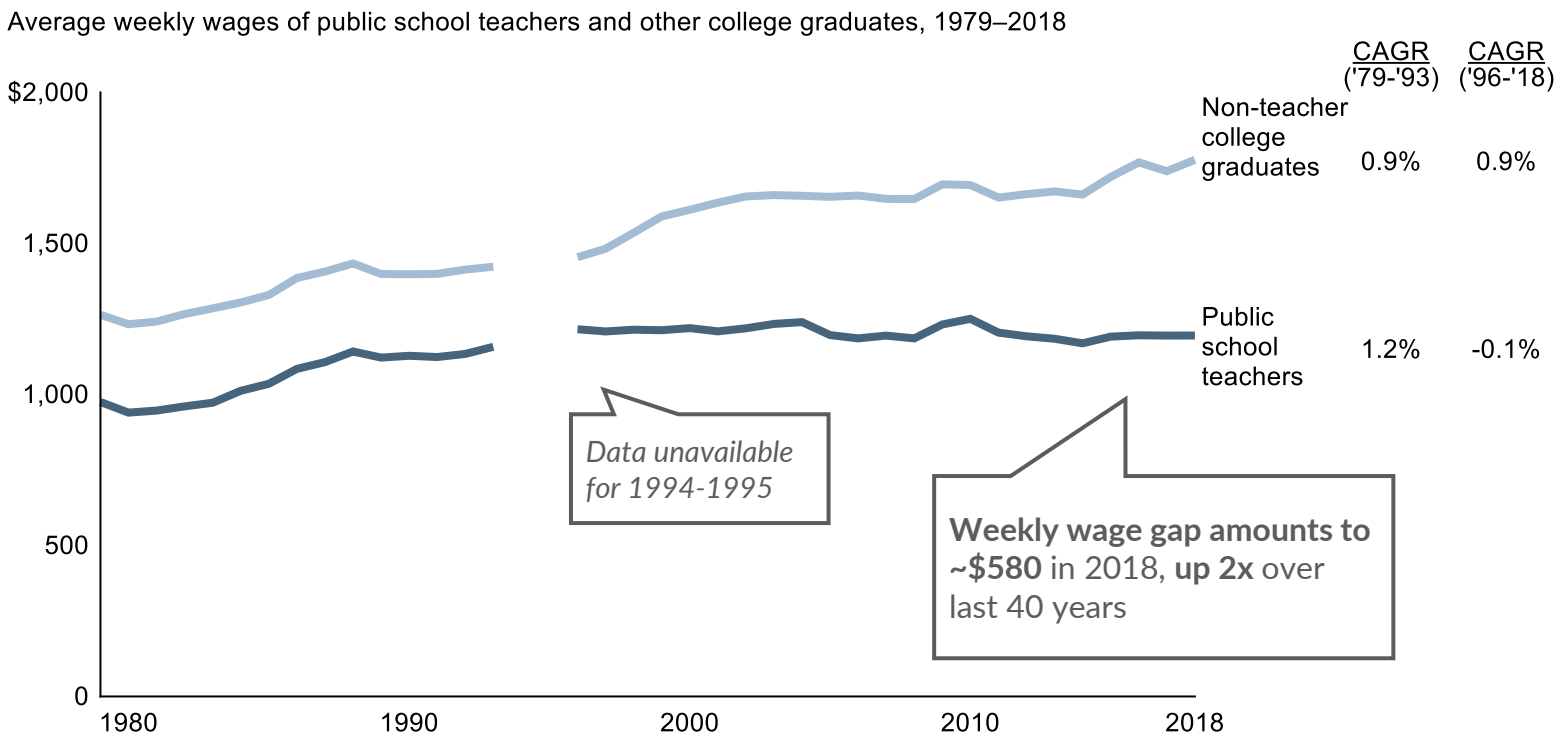


Source: Institute of Education Sciences; Brookings Institution; Wall Street Journal, The New York Times; US DOE ARPA Fact Sheet; MDR; NCES; EdWeek; AACTE; industry participant interviews

Widening wage gap coupled with heightened expectations from parents, administrators, & regulators hurt teacher morale

IMPACT OPPORTUNITY | TEACHER WAGES

Teacher weekly wages have not grown from 1996 to 2018, creating a widening wage gap between teaching and post-graduate alternatives



Note: Figure shows weekly wages (2018$) of public-school teachers (elementary, middle, and secondary). Non-inputted data are incomplete or not available for 1994 and 1996
Source: Economic Policy Institute

Perceived burden of teaching is increasing while incentives decline

*"**Teachers are not compensated competitively**, which thins out the pipeline while others are leaving the profession. **Even benefits are dwindling.**"*
Dir. of Tech Integration, Public school district #4

*"In 2019-2020 it was all **'teachers are heroes', but the conversation changed very quickly with NAEP scores...** If it's a **hard job and it's thankless**, like nursing, it can be **hard to weather through.**"*
Asst. Superintendent, Public school district #1

*"There are a lot of people out there that don't want to come to work and that want **flexibility, which you can't really get in public education.**"*
Chief Business Officer, Public school district #5

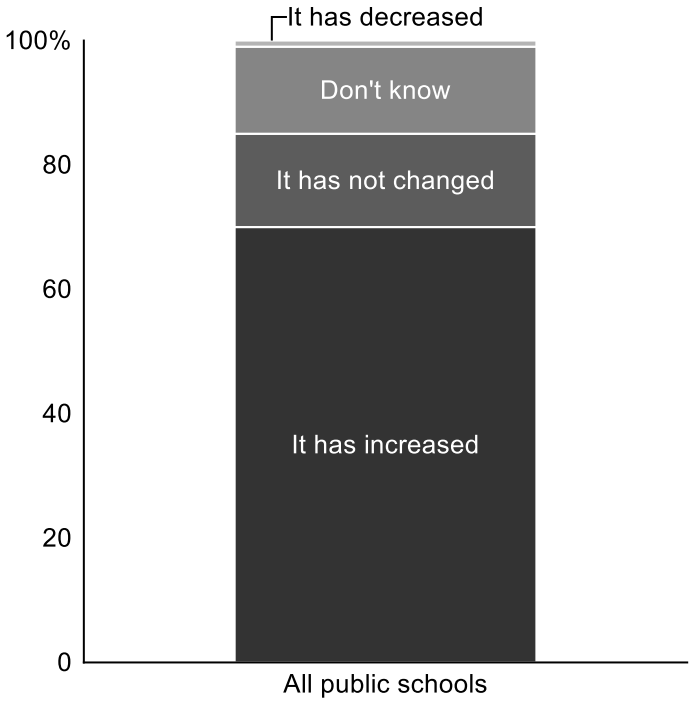
*"People are getting yelled at for not going to work during the pandemic...So we have people **leaving the field** and people in the field that are **experiencing burn-out**."*
Asst. Superintendent, Public school district #1

Students' mental health has deteriorated since the start of the pandemic; schools struggle with how best to cater to these needs

IMPACT OPPORTUNITY | MENTAL HEALTH

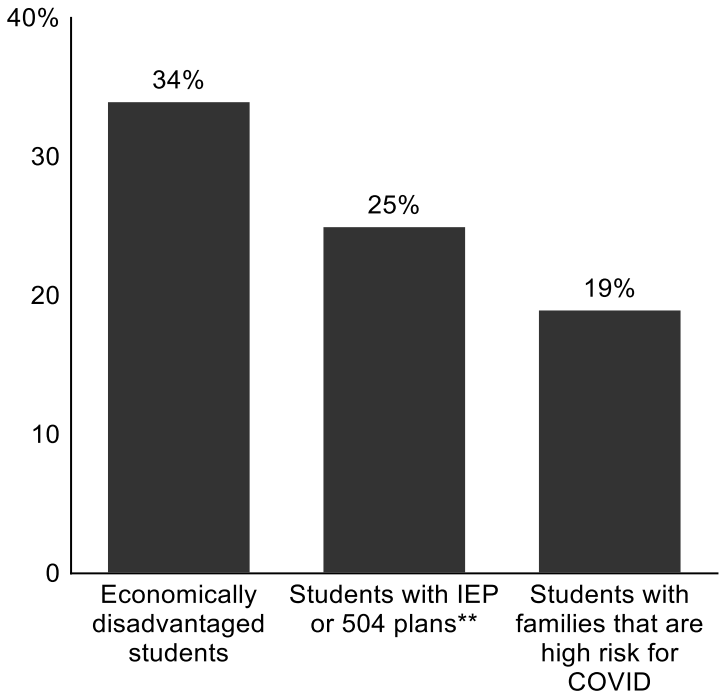
~70% of schools report students seeking mental health services more since COVID

% of public schools by change in degree to which students seek mental health services from school since COVID



Support sought by economically disadvantaged students has increased most since COVID

% of public schools citing student groups as seeking mental health support more than others since COVID - Top 3 groups*



With mental health challenges, pressure on schools to provide critically important support has increased

*"Schools are warehousing students. They're not teaching them. **No one is equipped to handle the mental health issues** that students are coming to school with."*
Associate Superintendent, Public school district #6

*"We were having 3-4 5150 Holds*** per week out of about 30k students during COVID. **Mental health challenges absolutely increased**."*
Chief Business Officer, Public school district #5

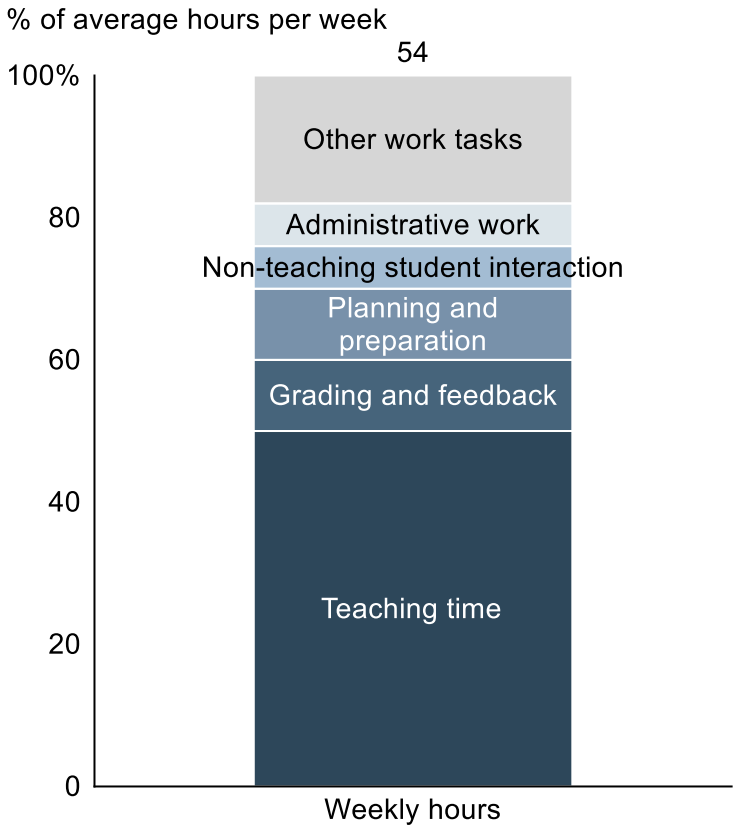
*"**All mental health problems got worse over the pandemic**, whether it was due to issues with housing, parental, or food instability. For some kids, especially in urban areas, **school is their safe space**."*
Associate Superintendent, Public school district #6

Note: (*) Other groups by rank include LGBTQ+ students, students experiencing homelessness, English Learner or English as a Second Language students, students from particular racial / ethnic backgrounds, students in Gifted and Talented programs, migrant students, other; (**) IEP and 504 plans are created for students with disabilities; (***) 5150 Holds are placed on students deemed at-risk and harmful to themselves, due to concerns around self harm or suicidal thoughts / attempts
Source: Institute of Education Sciences; Industry participant interviews

Cumbersome administrative systems & processes create inefficiencies and somewhat stand in the way of teachers' ability to teach effectively

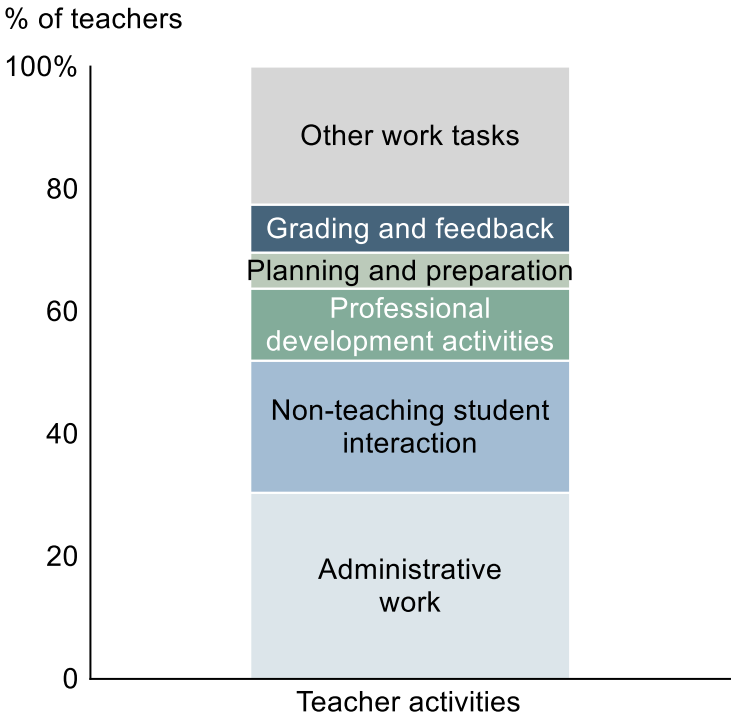
IMPACT OPPORTUNITY | ADMIN SYSTEMS

Teachers spend only ~46% of time teaching



~30% of teachers cite administrative work as their least efficient activity

If you could spend less time on one of these tasks, which would it be?



Teachers report lack of time to prepare for classes and innovate

*"Teachers have **a lot of menial tasks. They would benefit from technology to streamline their workday** and give them space to prepare for classes."*
Director of Tech Integration, Public school district #4

*"Since we returned after quarantine, **I now do 1.5 extra hours a day of duties.** This infringes on my time to prepare for my classes effectively."*
Elementary school teacher, Public school #1

*"I have not had more than 15 minutes for lunch all year and must supervise my students during lunch, making **it tough to interact with other professionals, come up with innovative ideas, and consult about students.**"*
High school teacher, Public school #2

*"Principals and teachers aren't well equipped to work with the bureaucracy it takes to get things done – **there needs to be training around organizational effectiveness.**"*
Education advisor

Source: EdWeek Research Center; Merrimack College Teacher Survey 2022 (N=1324); Industry participant interviews

Superintendents' focus on challenges across school administration often precludes them from tackling issues with instruction

IMPACT OPPORTUNITY | OTHER CHALLENGES

Challenge	Description	Commentary
Stakeholder engagement	• With COVID raising expectations of more frequent contact, administrators are grappling with how to most effectively shift to **bidirectional communication** with the parent body and broader school community (managing consitutents)	*"One aspect of the work that is particularly challenging for superintendents is **stakeholder engagement & management**, which is a **growing pain point post-COVID."*** *"There are decent **parent engagement platforms,** but they focus more on school-level logistical communication and robocalling, **not district-level communication or engagement."***
Organizational effectiveness	• Public school systems often face blockades to major strategic changes because they are structured as **governmental bureaucratic organizations**	*"One challenge is how to work well in a bureaucracy and manage complex institutions – **there's a lack of development around managing organizational effectiveness of government institutions,** which may not be directly addressable by companies."*
Student wellness & safety	• Threats of violence (e.g., school shootings) and cyberattacks have risen to the forefront of many superintendents' minds, with **student safety being the single most important priority for many,** if not all	*"**[Campus safety]** is something that **I think about, if not definitely daily, probably hourly."***
Logistics & transportation	• Many obstacles to successful student transportation exist, including **regulations making operations costly** and **hybrid online schedules**, but **bus driver shortages** are the single most taxing	*"The Boston Public School system is having a **massive shortage around buses and bus drivers which is resulting in kids not being picked up on time**. It's fires like this that superintendents are putting out on the daily."*
Demographic trends	• Student bodies are shifting in terms of demographics, with trend towards a **higher POC student population** • Superintendents are faced with questions of if and how to **address key educational disparities for groups most impacted by low NAEP scores** or similar indicators (e.g., providing additional support in critical subjects)	*"The **POC population is growing in terms of student body**, which can create **complications for how superintendents lead curriculum** – NAEP scores are lower for those populations, and that will continue to be more problematic in years to come."*

Source: Industry participant interviews; K-12Dive

Multiple trends likely to make the next decade feature substantial changes to how schools use tech, creating opportunities for investors

IMPACT OPPORTUNITY | DIGITAL | PRELIMINARY

Schools are now equipped with the right infrastructure

- In '22, **~82%** of elementary-high school students had **1:1 access** to a learning device, a **~35p.p. increase** over 4 years
- **Digital penetration is in early innings in core curriculum (40% vs. 80%+ in supplemental)**

*"**Technology is now at the heart of K-12 core curriculum** in a way that it wasn't before. Historically, you would only use technology for supplementary curriculum in case the Wi-Fi went down or something, but now it works 99.99% of the time, so **we can shift more to digital learning and tools."***

*"**Digital is here to stay** post-pandemic because of the **investment we put into devices, infrastructure, and Wi-Fi."***

*"We **went 100% 1:1 very quickly**. We're way more poised to have **consistent and reliable hardware and software thanks to the funding during the pandemic**… every kid has a Chromebook attached to their name"*

Teachers have shifted their behavior to accept technology

- COVID accelerated technological adoption for teachers due to **remote schooling**
- Those who did not want to learn new technological practices **retired during COVID**

*"There was a mass exodus of teachers during the pandemic – those that were tech-phobic likely retired. **If you survived the pandemic you were likely comfortable with tech."***

***"New teachers are more open to trying new tools** – they're digitally savvy."*

*"Teachers are also **more adept with tech because of COVID and remote schooling**."*

*"The **sustainability piece of tech integration resonates with teachers**. Digital effectiveness is quick feedback and analysis you can do across 500 students."*

There is new, exciting tech on the horizon

- **AI is a potentially groundbreaking technology in ed,** with applications across **teacher, student, & administrative** assistance
  - e.g., Natural Language Processing-enabled voice tools to assist with early reading, voice-to-text tools for 'auto-grading', student monitoring & identification of at-risk individuals
- **~$300M was invested into AI-enabled EdTech** in 2022, a **~15% increase** over 2021

*"The combination of AI development at a point where we have a staffing shortage raises the question of the **optimal blend of human & digital interaction for students** and how they spend their day."*

*"With AI, it's the first time I've said, **'I think this could credibly change the way we teach in a way that parents are actually happy with'."***

***"I think AI is real and here to stay.** But we have to be cognizant of things like ChatGPT – we have to make sure we can train teachers to understand this tech."*

Source: CoSN Annual Infrastructure Survey Report 2018, 2019; CoSN EdTech Leadership Survey Report 2020, 2022; industry participant interviews

AGENDA

Impact opportunity overview

Role of for-profit in addressing opportunity

Market frictions in education

Role of philanthropy

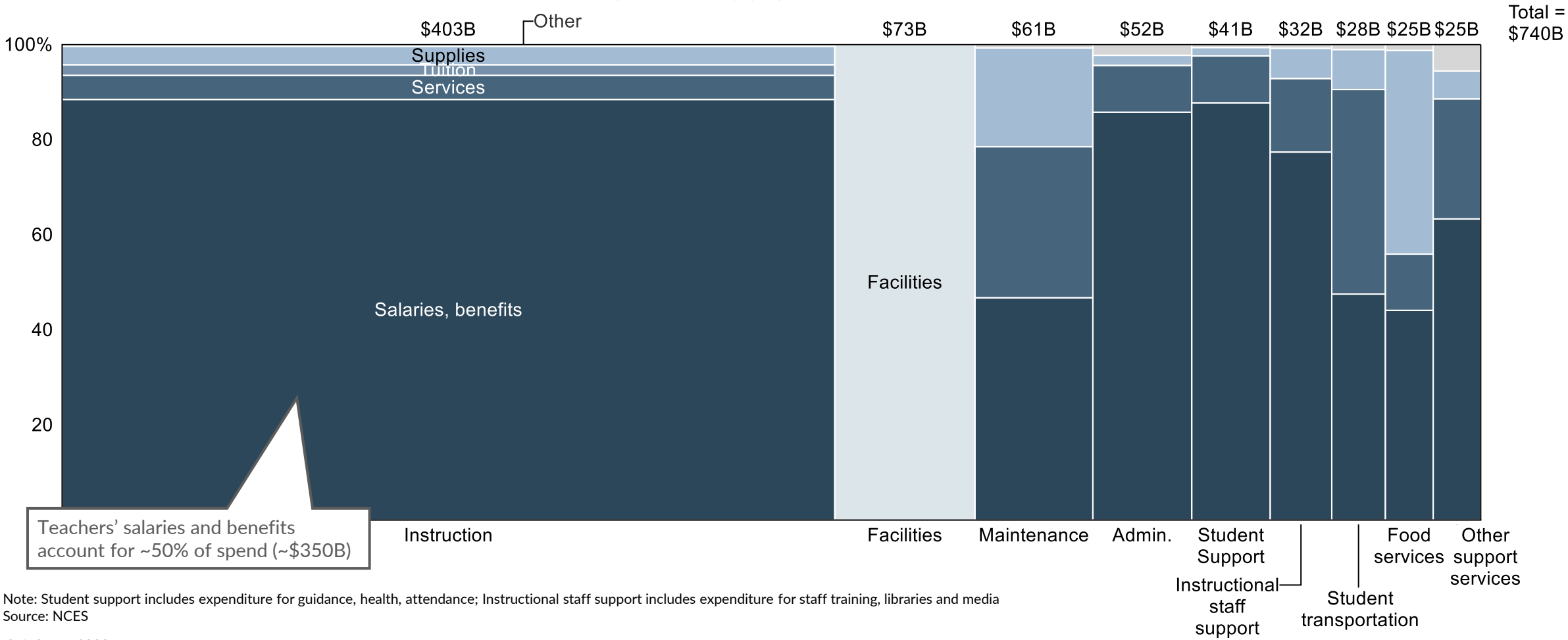
For profit companies are and will continue to play a significant role in addressing these challenges

ROLE OF FOR-PROFIT | PAIN POINTS

Core challenges	How for-profit players can address challenges	For-profit players provide solutions across sub-sectors
1 **Low curriculum quality**	• Publishers have high control over curriculum **design, quality, & UI/UX** • Product usage is strongly correlated to publishers (esp. legacy) with **robust salesforces**	*K12 content and curriculum*: Houghton Mifflin Harcourt, desmos, Curriculum Associates, McGraw Hill, SAVVAS LEARNING COMPANY, dreambox LEARNING *PreK content and curriculum*: TIME 4 LEARNING, LEARNING BOX
2 **Incoherence across materials, tools, & platforms**	• Products can be aligned to **standardized learning objectives** • Tools can be designed to **integrate with other tools** at varying levels of compatibility	*K12 content and curriculum*: desmos, dreambox LEARNING, Curriculum Associates, McGraw Hill, Houghton Mifflin Harcourt, SAVVAS LEARNING COMPANY
3 **Teacher workforce quality & shortage**	• Teacher PD programs can be designed to be relevant to **current classroom practices** • Tools exist that **improve teacher time allocation** (e.g., grading), impacting **retention**	*K12 B2B services*: BloomBoard, BetterLesson, Houghton Mifflin Harcourt *Backend software*: PowerSchool, workday., frontline education
4 **Diminishing student health and wellbeing**	• Companies provide **SEL and teacher PD** to improve wellbeing & quality of student support • Companies develop tools & services to **simplify access** to mental health resources	*PreK-12 B2C services*: RULER, PresenceLearning, Carnegie Foundation for the Advancement of Teaching, PANORAMA, THE STEPPING STONES GROUP, INVO BEHAVIOR AND THERAPY SERVICES
5 **Cumbersome existing admin processes**	• ERP systems simplify & automate processes, increasing teacher **capacity** and **sustainability** • Effective **onboarding and training** can help teachers **minimize time** on administrative tasks	*Backend software*: Blackboard, workday., PowerSchool, ParentSquare

Total public K-12 education market spend is ~$750B, of which ~70% is spent on salaries and benefits for teachers and staff

% of total expenditures for public K-12 education in 2018-2019, including capital outlay ($B)

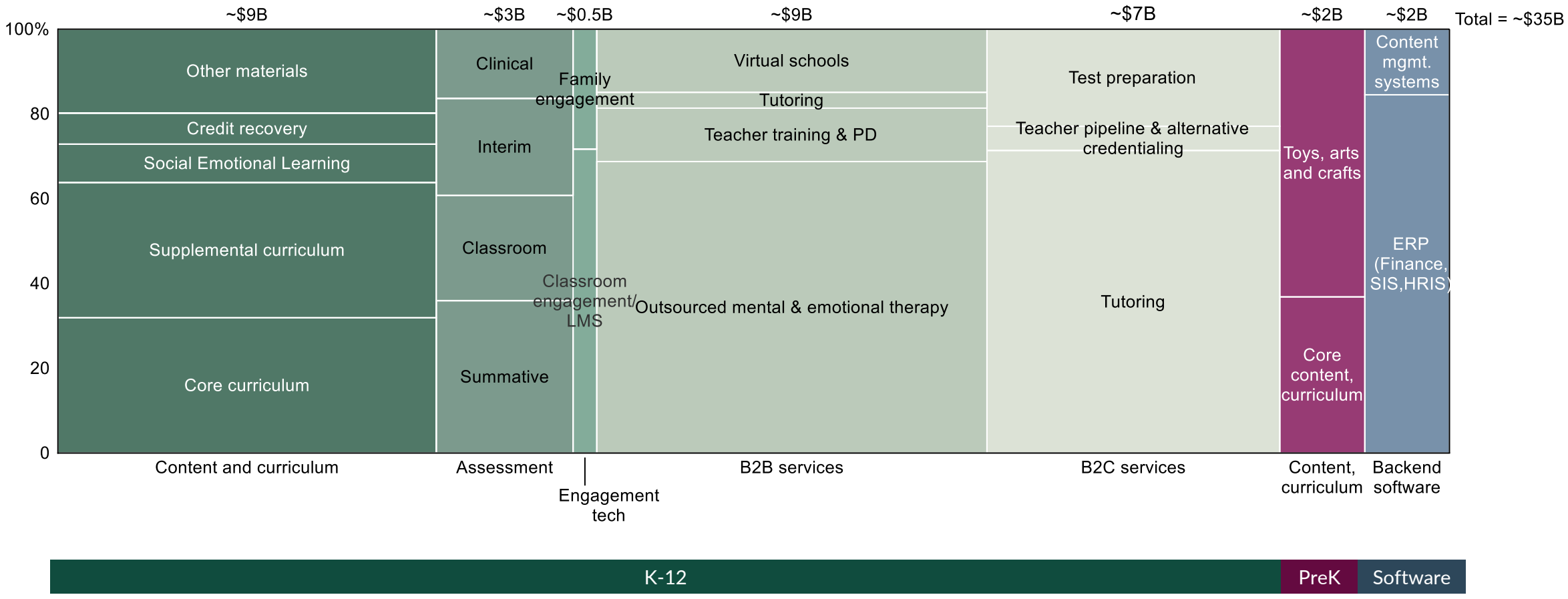


Note: Student support includes expenditure for guidance, health, attendance; Instructional staff support includes expenditure for staff training, libraries and media
Source: NCES

For-profit companies account for ~$35B of annual spend across essential products and services for education

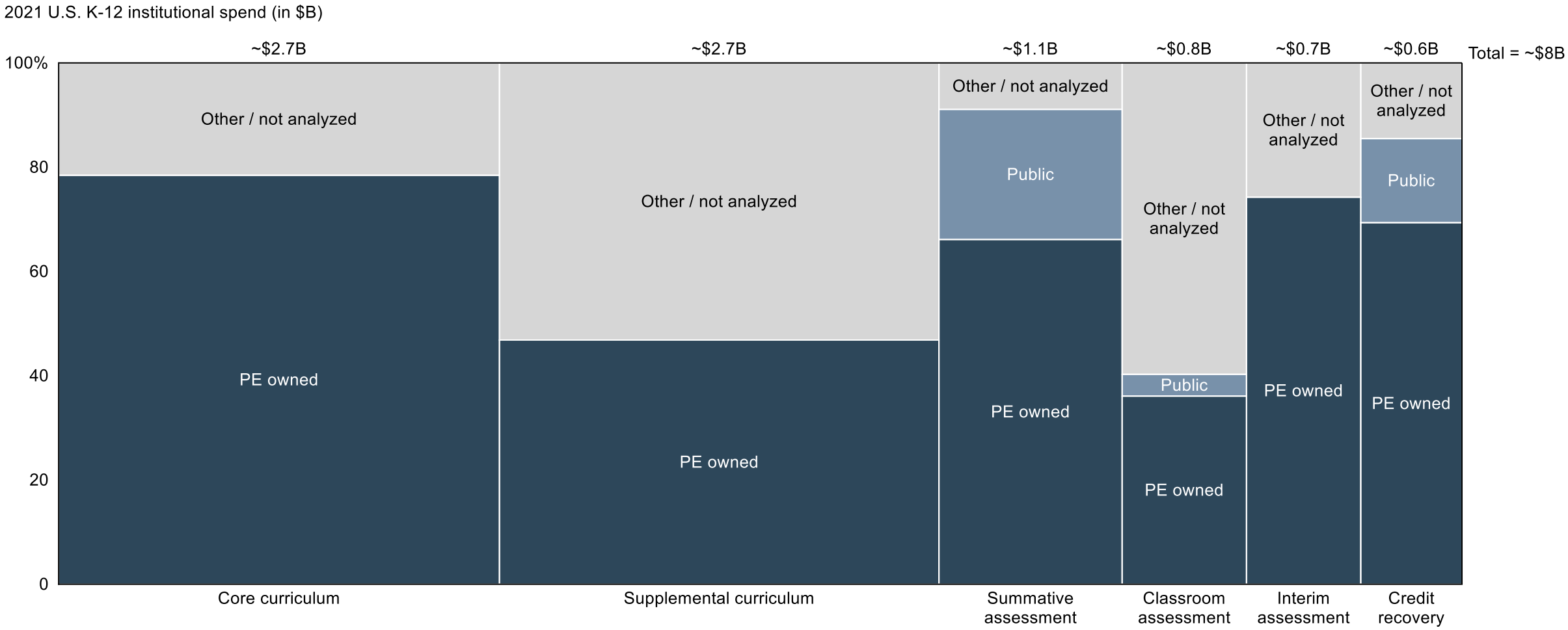
ROLE OF FOR-PROFIT MARKET

2021 U.S. pre-K to 12 institutional spend (in $B)



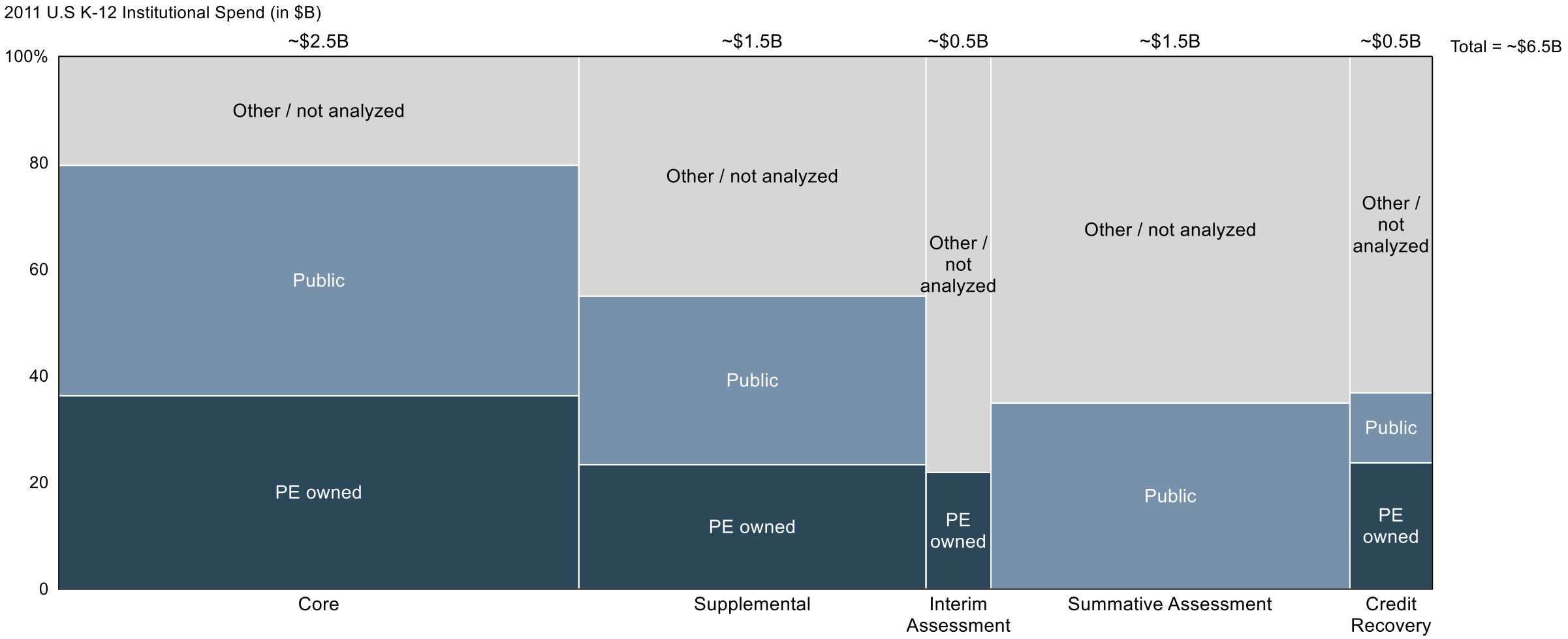
Note; ECE centers (Top 40 Chains account for ~$9B), private schools (~$90B), food services, logistics, school infrastructure not included; Classroom assessment includes grading and data analytics; SEL content and curriculum includes implementation services and training. Source: EdWeek; Gartner; LISTedTECH; NCES; Analyst reports (BMO, Morgan Stanley, Wells Fargo); Company filings and presentations; IBIS World

PE ownership is prevalent among K-12 companies with >50% of revenue in curriculum in assessment owned by private investors



Source: EdWeek; Gartner; LISTedTECH; NCES; Analyst reports (BMO, Morgan Stanley, Wells Fargo); Company filings and presentations

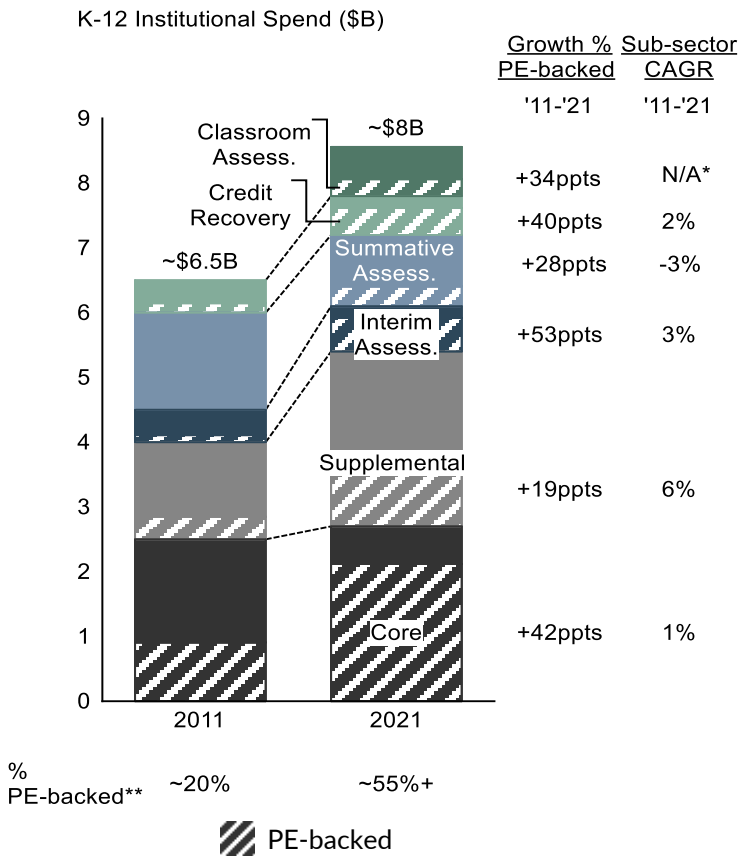
PE ownership in ‘11 significantly less prevalent among K-12 companies with ~20% of revenue in curriculum and assessment privately backed



Source: Lit. search; Company filings and presentations; EdSurge;

Growth in PE backing and supplemental spend a function of several macroeconomic & political changes, incl. the GFC, NCLB, and COVID

PE backing in the ed market has grown significantly over last decade



Underlying drivers of change in last decade

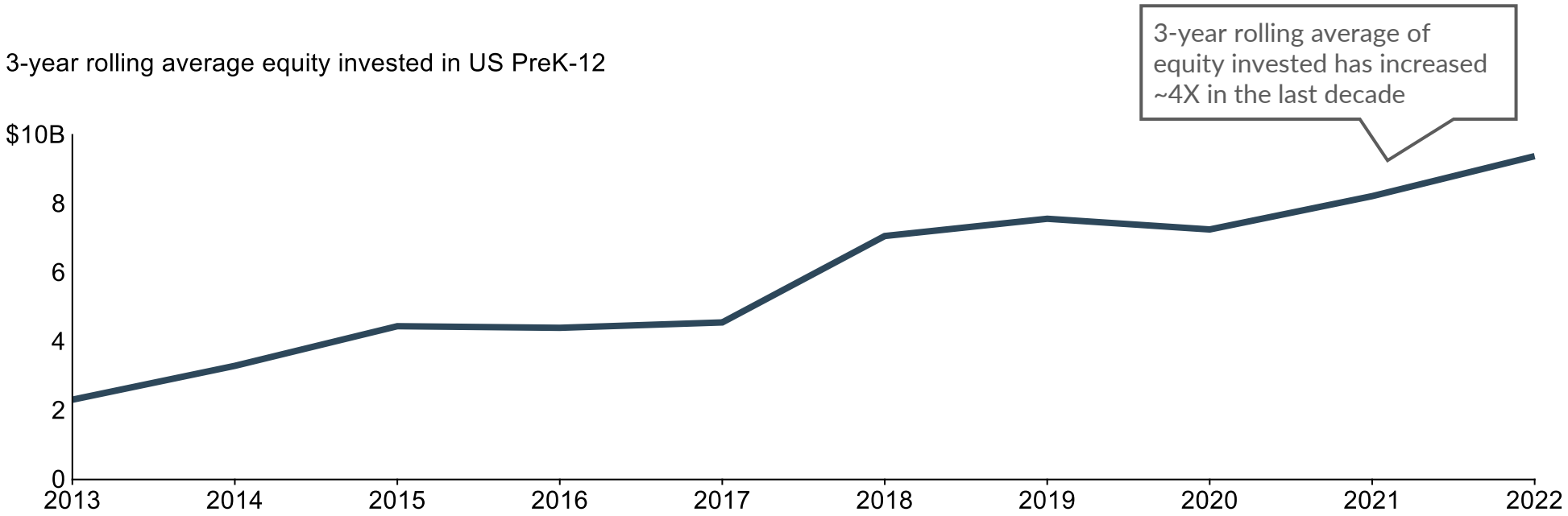
- Following the **Global Financial Crisis (GFC)**, private backers bought out several core curriculum players to salvage them from **bankruptcy**
- **Supplemental grew** due to several factors and growth profile **attracted investors**:
  - In response to the recession, schools shifted towards a higher share of **supplemental spend as budget cuts meant less latitude for core spend**
  - Following the 2001 **No Child Left Behind** (NCLB) act incentivizing demonstrated scores increases, schools leveraged supplemental materials to raise performance among targeted groups
  - Tailwinds from **digitalization** further grew supplemental solutions
- NCLB's focus on student proficiency and accompanied risk of loss of Title 1 dollars focused attention on **interim benchmarks**, an important input for schools to pulse check current performance against targets
- **COVID-driven core adoption delays as well as need for digital tools for remote learning** furthered stronger supplemental growth and weaker core growth
  - However, spend in sub-sectors across the board appreciated in size due to inflows of **ESSER funding** following COVID

Potential future evolution

- **Supplemental's replacement of core will slow** in coming years, largely due to **dissipation of tailwinds**
  - Emerging from COVID, schools are **bouncing back to typical core adoption cycles** while weaning off some supplemental point solutions
- **Platforming is expected to continue** as additional private equity investments drive consolidation of players into more unified solutions
  - Significant **scale benefits** (given market fragmentation), driving platforming
  - Players with **platformed solutions are growing faster** and likely will continue to **subsume share** from smaller players
  - **Accordingly, total PE backing** in the space is expected to continue to experience **steady growth** as seen in previous years
- **Digitalization** will continue to make waves in core and supplemental curriculum

Note: (*) CAGR is not computable as classroom assessment was negligible in 2011; (**) Share of PE-backed companies is calculated as number of PE-backed companies relative to all PE-backed and publicly owned companies
Source: EdWeek; Gartner; LISTedTECH; NCES; Analyst reports (BMO, Morgan Stanley, Wells Fargo); Company filings and presentations; EdSurge

Private investment activity within the PreK-12 space is increasing, with sustained growth of private capital over the last 10 years



	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Equity invested in US PreK-12 Market ($B)	$4B	$5B	$5B	$4B	$5B	$12B	$5B	$4B	$15B	$9B
NA buyout deal values, exc. SPACs ($B)	$183B	$200B	$402B	$193B	$244B	$312B	$262B	$244B	$537B	$347B
% of deals	2%	2%	1%	2%	2%	4%	2%	2%	3%	3%

Note: US PreK-12 market includes all deals with targets directly focused on PreK and K-12 and with equity investments greater than $10M. Relevant deals with unknown deal values (~100 deals) were included by assuming a deal value to headcount ratio of ~$300K. Deals with multiple investors were fully assigned to the main investor in the deal. Does not include facilities and operations.
Source: Dealogic; Pitchbook; SPS; Crunchbase

AGENDA

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Demand for quality & coherence can be attenuated by market frictions, resulting in lowered incentives for companies to deliver both

MARKET FRICTIONS	STAKEHOLDER INCENTIVES			
	 **User** *Teachers / student who use the products and services*	 **Decision maker** *Decides products / services purchased with best student outcomes in mind*	 **Company / Vendor** *Develops and delivers products and services to optimize financial outcomes*	 **Investor** *Invests and supports company in a way that optimizes financial outcomes*
In a perfect world …	• **Able to identify** high-quality and coherent products and services, and **provide feedback** to decision-makers	• **Have clarity** on product and service quality and coherence • **Demand high-quality and coherent** products and services from companies / vendors • **Prioritize long-term benefits of switching** to higher quality, more coherent products and services	• **Consistent creation** of high-quality and coherent product and services **aligned with decision makers' expectation**	• **Provide deep expertise** to support companies (e.g., empathizing with DMs, sharing key market trends) • **Capital alignment and shared long-term view** with decision makers and companies
Barriers that result in misaligned company incentives	• **Overwhelming amount** of materials to choose from • **Insufficient ratings/information** on products and services causing **uncertainty on quality** • **Limited or no involvement** in decision-making processes • **Lack of training** on the optimal utilization of materials	• **Uncertainty on quality** of products and services and limited input form users • **Risk aversion** to changing products and service (e.g., job protection, teacher retention) • **Fragmented and balkanized decision-making** around budgets and resources • **Fragmented DM market** results in less buyer power • **Long procurement timelines** limit vendor adoptions	• Focus on **meeting most demanded DMs' requirements**, which are to typically to meet state-mandated guidelines • **Unlikely to make investments in quality or coherence** due to low perceived ROI given DMs do not demand it today • **Oligopolistic market structure** in some segments contributes to greater supplier power and inertia to change	• Focus on **investment exits within five years or less** • **Align with company's incentives to meeting only baseline criteria** and not investing in projects with uncertain, thought potentially transformational, outcomes • Historic investments in education done by **investors for whom impact and quality/coherence focus are secondary to financial outcomes**

Source: Industry participant interviews

Company leaders suggest they would make different decisions based on a shift in demand signals which could be aided by mission-aligned capital

MARKET FRICTIONS | STAKEHOLDER INCENTIVES

Decision maker demand signals attenuated by uncertainty in quality, risk aversion, fragmented decision-making

1. Decision makers **cannot always distinguish between high-quality and low-quality products and services**

*"We'd like to do right by teachers, but **we don't know which products are high quality**."*

*"Unfortunately we don't have an EdReports for supplemental curriculum, assessments, engagement tools – the list goes on. **It can be difficult to tell what's truly good for our teachers and students**."*

2. Decision makers often **seek stability** in their roles and may be **hesitant to take risks** by implementing significant changes to products or services

*"It's very **hard to make generational changes when you have a 4-5 year view**, which is what a typical superintendent timeline looks like. There are other things that have our attention right now outside of curriculum."*

*"Curriculum right now is not visibly broken or fixable in the short term. **The thought of retraining your entire staff because it might have an impact in 10+ years doesn't sound particularly appealing** … it's hard to say that's the most critical thing to do."*

3. **Fragmented decision-making process and budgets results in limited demand for coherence** as decisions for products that would benefit from coherence (e.g. core-assessment-supp-tutoring, etc) are separate

*"Decision making in education is **extremely fragmented**. This is **especially true in larger school districts** where each product or service will likely have a different buyer."*

Source: Industry participant interviews

Investors are preservative due to greater uncertainty and longer time horizon in education investments

1. Transformational changes in education tend to happen over **longer time periods** and result in a **wider fan of potential outcomes**

*"You **need people looking at the 10-year horizon who are willing to ride that out.** In many cases people end up holding assets 5+ years, so why not going in knowing that and expecting you can make some money at the end."*

*"**How patient your capital is impacts where on the complexity / difficulty spectrum you invest**. Building a fully integrated solution takes a lot of time and is hard."*

*"There are a lot of policies in education … It **can take years to produce a good product that's ready for market** and follows state regulation. On top of that, **buying cycles are super long so it takes a long time to gain traction**."*

*"Many companies are 'platforming' but not actually integrating to improve the overall system. This is because **leaders are focused on increasing the value within 3 years even though fundamental change takes 10+ years**."*

2. Most **investors are accustomed to looking at returns over shorter time horizons** and faster exits (**typically 4-5 years**)

*"While companies can be well positioned to create big changes in core curriculum and the CEOs might be **intellectually curious, they wouldn't back that curiosity with R&D spend**. **Instead, they stayed the course because the company was minting cash."***

*"Two main assessment platforms in K-12 are doing the same thing and effectively solving the same problems. When they merged businesses, they **didn't do anything to rationalize the portfolio because they thought they were going to flip the business in 12 months**."*

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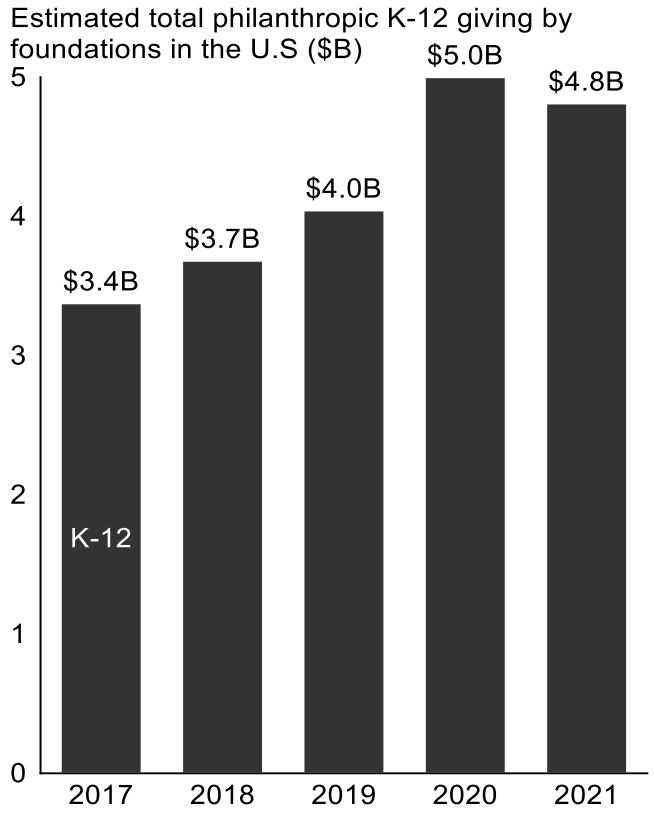
Philanthropy plays an important role in education funding …

ROLE OF PHILANTHROPY

/ NOT EXHAUSTIVE

Foundations contribute ~$5B to K-12 education annually



Philanthropic program examples support initiatives focused on driving innovation, policy reform and teacher support

Example Foundation	Focus areas
BILL & MELINDA GATES foundation	• Instructional coherence, especially within math • Usage of high-quality instructional materials and effective instructional systems • Teacher professional development and support • Education equity and policy reform
WALTON FAMILY FOUNDATION	• Charter schools • Teacher professional development and support • Education equity and policy reform • Education Venture Capital fund to invest in innovate solution
Bloomberg Philanthropies	• Charter schools • Education reform • Summer & exchange programs
Michael & Susan Dell FOUNDATION	• Teacher professional development and support • High-quality schools • Classroom tools, tech and resources

Note: Philanthropic education giving by foundations in the U.S. is calculated by multiplying the total value of contributions towards education organizations in the U.S by the percentage of contributions from foundations in the U.S; Philanthropic K-12 giving is calculated with ratio based on $5B K-12 giving in 2021;
Source: GivingUSA; Lit. search

… and is a critical complement to private companies with work that supports decision makers and is starting to reduce market frictions

ROLE OF PHILANTHROPY

Philanthropy can continue to influence key decision makers in education and shape demand signals

Key decision makers	Advocacy for policy changes that better align to student outcomes	Shaping demand and empowering decision makers	Seed investment in early innovations supporting nascent ideas	Broad investment in research and development	…
	Example: Driving state implementation of evidence-based reading through advocacy	*Example: EdReports informs school leaders on quality of products and services*	*Example: Investing product R&D new learning tools/services such as Zearn, OpenSciEd, etc.*	*Example: Funding WestEd's academic research on improving educational outcomes*	
State DOEds (Set education standards and budgets that district leaders need to follow)	✓			✓	
District Leaders (Key decision maker for products and services within district)	✓	✓	✓		
School Leaders (Key decision maker for school-level purchasing)		✓	✓		
		✓	✓		

Source: Lit. search; Industry participant interviews

Philanthropy-driven legislation changes centered around the Science of Reading (SoR) has increased demand for high-quality reading vendors

ROLE OF PHILANTHROPY | SOR

Low reading proficiency indicated poor literacy instruction methods

- States had no **standard approach to decide on a reading curriculum**, leading to severe inconsistencies in district curriculum adoption
- Teachers struggled to find **effective ways of teaching literacy** such that all students achieved reading proficiency
  - Some were reported still using instruction methods (e.g., Three-cueing systems, Units of Study) proven to be less effective)
- NAEP scores indicated 2/3 of fourth graders are not proficient in reading

"District adoptions are all over the map. You have hundreds of individual districts in each state making simultaneous decisions, using their own rubrics and processes"

Education Policy Researcher, USC

"If the research and evidence behind Science of Reading is there, why do we continue to submit our students to an old operating system"

CEO of UnboundEd

Research and advocacy on SoR spurred policy changes

Science of Reading Overview

- SoR is an **interdisciplinary body of scientifically-based research** on effective literacy instruction
- There are **5 key pillars** to SoR: phonemic awareness, phonics, vocabulary, fluency and comprehension

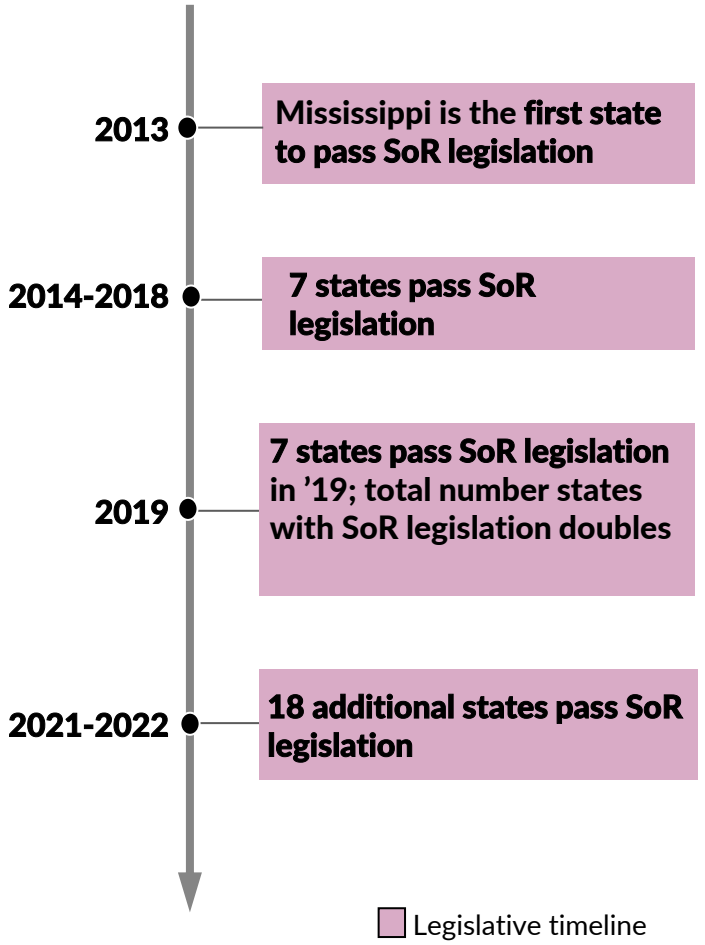
Research History

- The research behind SoR emerged in the **'90s and** gained relevance through the **National Reading Panel**
- Dr. Hollis Scarborough's "Scarborough Rope" (2001) and Mark Seindenberg's research (2010) renewed relevance of SoR

Policy changes

- Driven by research outcomes and advocacy efforts, **29 states have passed legislation focused on the Science of Reading**
- **Non-profits** (including ExcelinEd, UnboundEd, Right to Read Project) play a **key role in driving legislative change**

Policy tailwinds favor high quality reading vendors



Source: APM Reports; NCES; EdWeek; Science of Reading: The Podcast; company websites

29 states have passed legislation based on the "Science of Reading" with focus on 6 requirements; 2021 saw 13 states passing reading laws

	Year	Teacher Prep	Teacher Certification	PD / Coaching	Assessment	Materials	Instruction
Description		*Requires higher ed institutes, prep programs to teach evidence-based literacy practices*	*Requires current teachers to pass a test demonstrating ability to teach reading*	*Requires teachers to undergo PD in evidence-based reading instruction*	*Puts forth requirements for assessment schools should use to measure reading progress*	*Mandates requirements for curriculum schools should use to measure reading progress*	*Requires teachers to use specific instructional methods*
Mississippi	2013	✓	✓	✓	✓	✓	✓
Alabama	2019	✓	✓	✓	✓	✓	✓
Oklahoma	2019	✓		✓	✓	✓	
Colorado	2019		✓	✓	✓	✓	✓
D.C.	2020			✓	✓	✓	✓
N. Carolina	2021	✓	✓	✓	✓	✓	✓
Tennessee	2021	✓	✓	✓	✓	✓	✓
Alaska	2021		✓	✓	✓	✓	✓
Arkansas	2021	✓	✓	✓		✓	✓
Connecticut	2021			✓	✓	✓	✓
Florida	2021		✓	✓	✓	✓	
Virginia	2022	✓	✓	✓	✓		✓
Arizona	2022			✓	✓	✓	✓
Connecticut	2021			✓	✓	✓	✓
Utah	2022	✓		✓	✓	✓	✓
Kentucky	2022	✓	✓	✓	✓	✓	✓

Note: States not included in the table above that have legislation addressing the Science of Reading include: NV, NM, ND, CA, RI, SC, TX, MI, NE, PA, WV, DE, LA, MN, MO, as they cover fewer requirements than the states listed. Source: EdWeek

Shaping demand: EdReports has highlighted high-quality products and helped influence demand signals (1 of 2)

Uncertainty on quality of products and services contributed to weak demand signals towards HQIM*

- Key decision makers (KDMs) struggle to **decipher quality of curriculum offerings** due to fragmented nature of users, sheer quantity of curriculum, and long timelines to assess outcomes
  - Compliance with state standards is a low bar for quality and often does not account for coherence and usability
- Limited information **makes KDMs averse to adopting new curriculum** and susceptible to continuous usage of LQIM
- Big three providers were not pressured by demand signals **to improve their low-quality offerings** due to the oligopolistic market structure

*"There's too much out there. We literally have people who dedicate their time to sorting through these resources before introducing to our teachers. **It's very time consuming to figure out what's high quality and what's not**."*

Assistant Superintendent, Public school district #7

*"The Big 3 vendors have been slow to make meaningful changes and would often just **put lipstick over old material to present it again.**"*

Chief Business Officer, Public school district #5

EdReports founded in 2015 and funded by philanthropy to increase transparency and save DM time

EdReports Overview

- Mission is to increase the capacity of teachers, administrators and leaders to **seek, identify and demand HQIM**
- Reviews ELA, Math and Science curriculum for K-12
- Founded in 2015 by **Eric Hirsch**

Key Funders

Bill & Melinda Gates foundation; Walton Family Foundation; William + Flora Hewlett Foundation; Charles and Helen Schwab foundation; Carnegie Corporation of New York; Overdeck Family Foundation; Charles and Lynn Schusterman Family Philanthropies; Stuart Foundation

Key stats

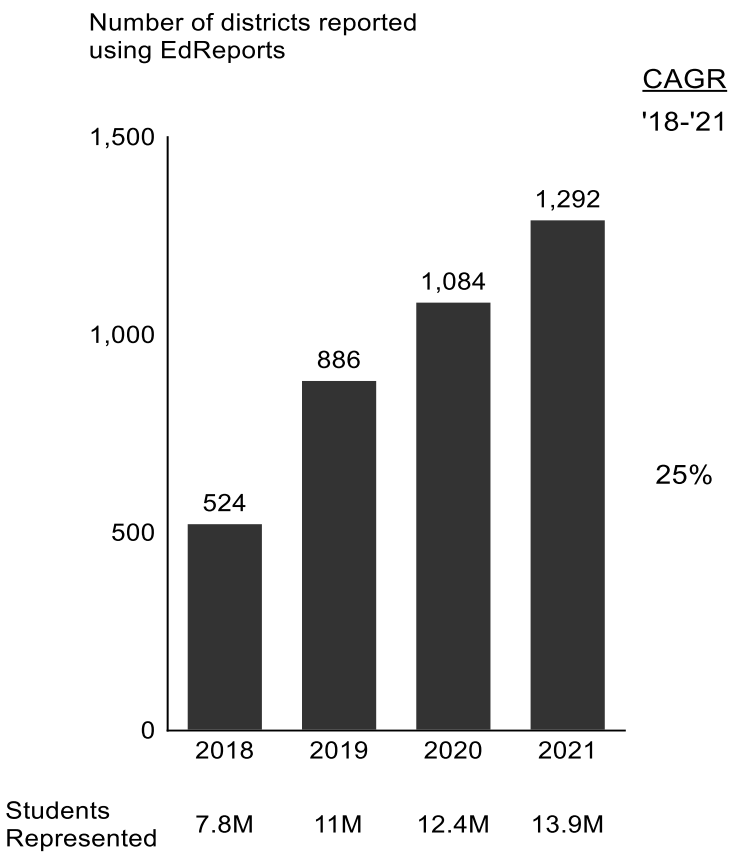
98%	Of ELA and math instructional markets reviewed since 2015 (~1K materials)
1,300	Districts use EdReports to inform curriculum decisions
14M	Students are represented by EdReports users
57	Districts partnered with EdReports in 2021
10	State DOEds partnered with EdReports in 2021

Note: HQIM means high quality instructional materials
Source: EdReports; Annual Reports; Lit. search; Industry participant interviews; company websites

Shaping demand: EdReports has highlighted high-quality products and helped influence demand signals (2 of 2)

ROLE OF PHILANTHROPY | CASE STUDY – EDREPORTS

More and more decision makers are now using EdReports



It has helped save KDMs time and change demand signals towards HQIM

- KDMs' usage of EdReports **streamlined curriculum selection processes** by providing clear, comprehensive reviews
- EdReports made **HQIM more evident to KDMs**, increasing likelihood of selecting a higher quality product or service

*"**EdReports gave examples of what great programs look like**. We know the reports were created by people who have spent extensive hours going through all the elements of a program."*
Assis. Superintendent, Bristol Warren Regional SD

*"EdReports' tools and instructional reviews not only supported a shared understanding of alignment indicators but **provided structures to facilitate a large group in calibration process**"*
Math Coordinator, Orange County DOEds

*"It's helpful to have a resource like EdReports… It **curates for you, and more importantly it saves you time**."*
Assoc. Superintendent, Public school district #6

Which has helped contribute to increase in HQIM in the market

+15 ppts *market share increase of high-quality vendors since '11*

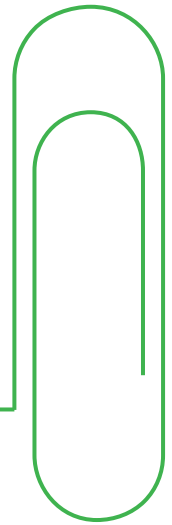
+13 ppts *increase in math curriculum meeting EdReports' expectation since '18*

+17 ppts *increase in teacher usage of math aligned materials since '18*

+7 ppts *increase in teacher usage of ELA aligned materials since '18*

Source: EdReports; Annual Reports; Lit. search; Industry participant interviews; company websites

Appendix



Sources

Primary interviews (N = 79, inc. 19 follow-up calls)

Advisors

- CEO, Content & Assessment company #1
- CSO, Content company #2
- Former CEO, Family office #1
- Managing Director, Family office #1
- Director, Philanthropic organization #1
- Senior Advisor, Private equity firm #1
- MD, Venture Capital firm #1
- Senior Advisor, Philanthropic organization #1
- MD, Venture Capital firm #2
- Former CEO, Philanthropic organization #2
- MD, Venture Capital firm #3
- A-Street Affiliates & Advisors (N=5)
- Gates Foundation Affiliates & Advisors (N=4)

Customers

- Assistant Superintendent, Public school district #1*
- Assistant Superintendent, Public school district #2
- Assistant Superintendent, Public school district #3*
- Director of Tech Integration, Public school district #4
- Chief Business Officer, Public school district #5*
- Associate Superintendent, Public school district #6*
- Assistant Superintendent, Public school district #7*
- Director of Curriculum, Public school district #8*
- Superintendent, Public school district #10*

Note: * indicates 1 or more follow-up calls conducted

Competitors

- Former Chief Strategy Officer, EdTech company #3
- Director of Customer Support , EdTech company #4
- Director of Curriculum, EdTech company #5
- Senior Director, Research & Analytics, EdTech company #1
- Director of Curriculum and Training, EdTech company #2
- Chief Sales Officer, EdTech company #6
- Sr. Director of Sales, EdTech company #4*
- Implementation Success Manager, Credit recovery provider #1*
- Former CEO, Credit recovery provider #2
- Former Director of Ed Partnerships, Tutoring company #1
- Former Chief Customer Officer, EdTech company #7
- Former CEO, EdTech company #6
- Former COO / CPO, Curriculum publisher #1*
- Chief Revenue Officer, Curriculum publisher #2*
- Former SVP of Strategy, Curriculum publisher #3
- Former VP of Sales, Wellbeing service provider #1
- Head of Sales, Wellbeing service provider #2
- Former VP of Sales, Wellbeing service provider #3
- Former Director, Wellbeing service provider #4
- SVP Learning Sciences, Measurement & Analytics, Curriculum publisher #2
- Lead Training Specialist, Curriculum publisher #5
- Former Director, Corp. Partnerships, Curriculum publisher #4
- Product Director, Integrations & Platform, Credit recovery provider #3
- Vice President of Product Development, EdTech company #8
- Director, GTM Strategy, Tutoring company #2
- Former CEO, Tutoring company #3
- Lead Training Specialist, Curriculum publisher #5
- Head of Proposal Management, Tutoring company #1
- Chief Languages Officer, EdTech company #10
- Board Member, EdTech company #11
- Vice President, Partnerships & Alliances, EdTech company #12
- Former VP of US Sales Strategy, Curriculum publisher #3
- SVP of Corporate Development and Strategy, EdTech company #9