

An Initiative of BSA | The Software Alliance

Al in Education

Teaching, Learning, Understanding: Al and Education

The value of learning cannot be overstated: school attendance results in <u>higher lifetime earnings</u>,¹ better <u>health outcomes</u>,² and happier, <u>more confident</u>³ people.

As the US Department of Education Office of Educational Technology notes, with artificial intelligence (AI), designers can anticipate and address the <u>long tail of variations in how students</u> <u>can successfully learn</u>⁴—whereas traditional curricular resources were designed to teach to the middle or most common learning pathways.

Al has the potential to address these challenges, as well as accelerating progress toward UN Sustainable Development Goals (SDG), <u>according to UNESCO</u>.⁵ However, they warn that developments have outpaced policy debates and regulatory frameworks. Al has immense potential for learning but its use in educational contexts must be guided by the core principles of inclusion and equity. This report explores the possibilities for AI in education, by addressing how current AI and digital solutions are helping in three key sections:

SECTION 1 Letting Teachers Teach

SECTION 2 Keeping Classrooms Relevant

SECTION 3 Including Every Student

Smart and responsible deployment of Al in the education sector can enable improvements in the way we learn, throughout life.

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To tackle the first shift, AI needs to help people get ready for the world of AI. AI and Machine Learning Specialists top the list of fast-growing jobs. <u>According to the World Economic Forum</u>,⁶ 44 percent of workers' core skills will change in the next five years. Training people for these jobs requires a whole new suite of tools, and a personalized approach to learning, which can be supported by technology.

None of this should minimize the role of teachers. Al cannot replace the human connection, especially for young and high-need learners. As McKinsey notes, <u>particularly for K–12 teachers</u>,⁷ "Many of the attributes that make good teachers great are the very things that Al or other technology fails to emulate." But at the same time, 20 to 40 percent of current teacher hours are spent on activities that could be automated. This is where Al can change the game, by freeing up teachers to focus on the areas where their input matters most.

Students' time can be spent more effectively, and the accessibility of digital materials can be enhanced, as well. Al can enable a raft of accessibility and other learning supports, from personalized reading formats, text-to-speech, and translation tools, to chatbots that remind students when assignments are due. Countries worldwide are striving to close the digital skills gap, and lifelong learning is essential for many jobs. Al that can offer students learning when and where they need it, in a way that reflects their digital reading needs and learning style, has the potential to change the way we think about education.

SECTION 1

Letting Teachers Teach

According to the California Department of Education, AI can <u>expedite administrative tasks and</u> <u>automate workflow for both educators and students</u>.⁸ This would enable them to focus on instruction and student support, freeing up time to build connections with students and target supplementary support. Getting AI to reduce teachers' administrative burden is a quick win for all parties.

McKinsey notes that implementing <u>technology in the classroom at scale is challenging</u>.⁹ Integrating effective software that links to student learning goals within the curriculum—and training teachers on how to adapt to it—is difficult. They believe that technology in the classroom is not going to save much direct instructional time.

Al can streamline administrative tasks, such as scheduling and resource allocation, allowing schools to operate more efficiently. This should form part of a wider picture, along with modernizing IT infrastructure in educational institutions. Supporting education providers through the transition to cloud-based systems, automation, and enhanced security measures enables them to reap the benefits of modern software solutions.

DX AT WORK

Microsoft

DX at Work: AI Helps Teachers With Reading Practice

Educators strive to meet the literacy needs of all learners and accelerate learning, but often lack the time and resources to collect and analyze literacy data, because listening to each child in a class read individually is a time-consuming process. <u>Microsoft Reading</u> <u>Progress and Reading Coach</u>¹⁰ can listen to kids read, thus saving educators' time, providing actionable and timely data, and giving useful insights for student learning.

Educators assign appropriate passages to individuals or groups; students then simply select the Assignment tab to begin their recording. Reading Progress also makes analyzing student fluency recordings quicker and simpler by auto-detecting reading errors, calculating correct words per minute, and tabulating accuracy rates. Educators can adjust the pronunciation sensitivity to better meet the speech and language needs of individual learners—enabling them to gain this vital, basic skill.

DX AT WORK

IBM

DX at Work: Jill, the Student's Friend

Jill Watson, a <u>cousin of **IBM**'s Jeopardy-winning Watson</u>, is an Al-enabled teaching assistant who can answer student questions about classes and curricula. Developed at Georgia Tech in 2016, Jill was first deployed onto the online discussion forum of a graduate-level computer science class in knowledge-based Al. She answered questions alongside a team of human teaching assistants; at the end of her semester-long debut, students were not able to distinguish which of the TAs was the Al.

"We continue to build more powerful versions of Jill Watson every semester," says Ashok Goel, a professor of computer science and cognitive science at Georgia Tech, and the creator of Jill Watson. "By now, Jill Watson has been run in about 17 classes, including graduate, undergraduate, online, and residential. Next, we want to take her outside Georgia Tech."



workday.

DX at Work: Planning in a Time of Crisis

In March 2020, when the COVID-19 pandemic was starting to bite, the University of Virginia (UVA) had just concluded planning and budgeting for the 2020–2021 academic year. As the world transformed, the urgent need for a modern budget planning and analysis capability became apparent. UVAFinance quickly moved to prioritize the rollout of Workday Adaptive Planning with the help of Deloitte.

Using **Workday**, the UVA-Deloitte team built financial models,¹¹ processes, dashboards, and reports that helped the university respond to the impacts of COVID-19 and present a range of "what if" scenarios. UVAFinance is now approaching the budgeting and planning process with a new level of sophistication and confidence.

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docusign

DX at Work: Paper, Paper, Go Away

The average American school <u>uses 2,000 sheets of paper per day</u>,¹² many of them used by administrative staff who are tasked with completing, sorting, and filing the documents. This isn't the ideal solution for stressed and time-strapped administrators.

Located in the greater Houston area, Spring Branch Independent School District (ISD) has 35,000 students across 46 campuses. When Rick Gay signed on as director of procurement at Spring Branch ISD, he <u>turned to **Docusign** to help eliminate paper-driven contracting</u> <u>processes</u>¹³ that led to poor visibility, maverick spending, and slow turnaround times.

"My team handles everything from cafeteria food to construction, renovations, electricity and curriculum materials," said Gay. Getting the goods and services the school district needs on time and within budget is critical. By replacing multiple manual steps with a streamlined digital workflow, the procurement team slashed time-to-signature from days (or weeks) to less than 48 hours—and saved more than \$4 million in the process.

SECTION 2

Keeping Classrooms Relevant

Young people know they are growing up in a world that is changing rapidly; the Internet and smartphones are woven into the fabric of everyday life, and AI is the next big shift. Teenagers are asking their schools to look beyond the hype about AI chatbots and <u>provide broader learning</u> experiences¹⁴ that are grounded firmly in the present, not in science fiction.

An important part of providing broader and more enriching learning experiences for students includes a focus on media literacy. This is why as part of the Adobe-led Content Authenticity Initiative, the company worked with education experts to create media literacy curricula designed to help students develop critical media and visual literacy skills to better navigate the ever-changing digital information landscape.

At the same time, many adults who have been in the same role for years or decades can see changes coming in the way their job is done. Demand for tailored learning, at every stage of life, has never been higher. The IMF predicts that 60 percent of new jobs¹⁵ will be heavily affected by AI in the near future. The global workforce needs to be ready for that shift. AI can help educators make informed decisions about curriculum and teaching methods, identifying trends far beyond the classroom.

The digital skills gap (where demand for digital skills outstrips the talent available) is a real threat to global growth. In Europe, more than 90 percent of professional roles require a basic level of digital knowledge, just as they require basic literacy and numeracy skills. Yet, <u>around 42 percent of Europeans lack basic digital skills</u>,¹⁶ including 37 percent of those in the workforce. Publisher Wiley developed a Digital Skills Gap Index (DSGI), which shows that most economies are <u>failing to bridge</u> the digital skills divide.¹⁷ Singapore is the global leader, while the US ranks in 26th place.

To bridge this gap, digital skills need to be taught throughout the school system and beyond, as lifelong learning tracks digital developments. Al-powered adaptive learning systems can tailor content and pacing to individuals' needs, matching their own diverse learning styles. Interactive Al-powered learning tools and gamification can make learning more enjoyable for a generation that grew up online.

"We saw with a calculator decades ago, and [online] search[ing] 20 years ago, the way that we learn has changed as a result of these technology tools," said <u>Unity's Vice President of Education</u> and <u>Social Impact, Jessica Lindl</u>.¹⁸ "And so we want the power of human learning, and AI learning to happen collaboratively with everybody." Reskilling and upskilling have a vital role to play, she adds, and multiple pathways should be built into entry-level jobs so that people can learn within the industry.

The digital transformation has improved educational outcomes, reinforcing the value of investing in advanced technology and software solutions; traditional skills have also retained their value.

In the words of BCG's <u>Sylvain Duranton</u>,¹⁹ society needs both ancient Greek and Python to function. Intelligent adaptive learning platforms and data analytics, which enable students to reap the benefits of AI technologies, are the next logical step.

Educators also need to establish what is, and is not, a legitimate use of AI. Where does creative use of a new tool become unfair? An open, evolving conversation among all stakeholders is a prerequisite for a fair future. "I think of AI literacy as being akin to driver's ed: We've got a powerful tool that can be a great asset, but it can also be dangerous. We want students to learn how to use it responsibly," says Stanford education scholar²⁰ Victor Lee.

That means teaching that uses these tools, which vast swathes of the workforce will be expected to use in coming years. Rather than assigning a written report, teachers can ask students to analyze information and communicate their ideas through a compelling video, podcast, or infographic. "We need to embed AI literacy into courses," said Rowena Ulbrick, Academic director, Digital Literacies at Swinburne University, at a recent <u>Higher Education Executive Roundtable in Australia</u>.²¹ "Creating opportunities and authentic learning experiences, such as solving real-world problems, will ensure that students can demonstrate skills and use generative AI in ways that enhance learning."

DX AT WORK

Adobe

DX at Work: Don't Fake It, Learn to Make It

Generative AI is incredibly exciting but also opens the door to new questions about ethics and responsibility in the digital age. Many school systems have already integrated media literacy and digital citizenship skills into the curricula, so responsible AI can be a new addition to existing modules.

The Content Authenticity Initiative (CAI) is an **Adobe**-led community of major media and technology companies (and others) working to combat mis/disinformation by establishing the open-source industry standard for digital content provenance. It offers <u>free lesson plans</u> for middle school, high school, and higher education²² that enable teachers to explain the world of generative AI, that is, how information, including images, can be used to create narratives about people, issues, histories, and communities worldwide.

DX AT WORK

DX at Work: Skills to Pay the Bills

As generative AI revolutionizes our world, the demand for AI software developers with the right cutting-edge skills is soaring. **IBM** has focused on AI in workforce development²³ through its SkillsBuild platform, which uses AI to analyze job market trends and create personalized learning paths for individuals. This initiative is particularly significant in bridging the skills gap and preparing students for the evolving demands of the job market, showing how AI can extend beyond traditional education to support lifelong learning and career readiness.

Individuals can launch their AI career in just six months, with no prior AI or programming experience required. IBM is committed to integrating AI into education, not only to enhance learning outcomes but also to support educators and prepare students for future challenges.



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DX at Work: French Flair for Teaching Al

In France, Microsoft has partnered with social enterprise Simplon²⁴ to train more than 25,000 people, about 40 percent of them women and about 44 percent without full or any college degrees. Most students come to the program via France's national unemployment agency; jobseekers with interest and potential are encouraged to enter the program, and the French government pays most of the tuition.

Participants in the AI training program spend four months in the classroom, seven hours per day. Then they spend a year in an apprenticeship at a company, with one week in class and three weeks on the job. Companies select candidates for apprenticeships from Simplon from the beginning of the training program. In this way, Simplon supports companies in a nontraditional recruitment process—producing strong recruits outside of the typical channels, such as level of education, professional background, and previous experience.



DX at Work: A Poster Child for Children's Posters

Free for K–12, **Adobe** Express for Education is built by and for educators.²⁵ The latest update integrates core and generative AI designed to be safe for classrooms. Students can unlock new opportunities for creative expression with simple text prompts to generate templates for posters, flyers, or brochures and original coloring pages.

"Adobe Express for Education is built by and with teachers, with AI that's designed to be safe for the classroom," said Mala Sharma, VP and general manager, creators and education for Adobe's Digital Media Business. "For more than three decades, Adobe has been creating technologies to help students succeed in the classroom and in the job market and we're excited to bring our responsible AI approach to this next chapter."

SECTION 3

Including Every Student

<u>UNESCO sees a role for AI in addressing current inequalities</u>²⁶ regarding access to knowledge, research, and the diversity of cultural expressions, along with a responsibility to ensure AI does not widen the technological divides within and between countries. The promise of "AI for all" must be that everyone can take advantage of the ongoing technological revolution and access its fruits, notably in terms of innovation and knowledge.

Al can help ensure no pupil is left behind in multiple ways. Al-based tutors can provide one-onone assistance to students, offering additional support outside of classroom hours. In a globalized world, making that support instantly available in multiple languages can make a huge difference to students.

There is also the question of when and how to deliver lessons. Al can build platforms that will help teachers automatically cohort students into groups and recognize when students are ready for a learning moment, according to <u>Cisco's Mary Schlegelmilch</u>.²⁷ These moments could be remedial or "just in time" lessons to enhance the learning process. Al can enable America to redesign and rethink our institutions of education.

In term of accessibility, Al-powered tools such as adjusting reading formats, text-to-speech, and speech-to-text can make educational content more accessible to students with disabilities. And Al systems can flag potential issues or learning difficulties early, allowing for timely intervention and support to ensure children don't get left behind in busy classrooms.

Education leaders know their profession is also on the cusp of a revolution in learning models. Virtual and augmented reality will provide more immersive and engaging ways to explore concepts, visualize complexity, collaborate on research, and bring learning to life in digital environments. Al's ability to tailor learning experiences to individual student needs can help improve student engagement and success rates.

With an eye to the future, scholarships and bursaries enable individuals from disadvantaged areas to access higher education. Often funded by generous alumni, AI and digital tools can support universities in running fundraising programs that extend the benefits of degree-level learning to new individuals and communities.



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DX at Work: Virtual Recruitment, Real Enrollments

Researchers at Rockhurst University and Purdue University's Krannert School of Management were keen to increase enrollment by addressing barriers to entry. They wanted to provide all prospective and current students with the same quality of service, however they get in touch, and whatever their native language or socioeconomic background.

Krannert and Rockhurst began closely analyzing student engagement on their websites to identify when, where, and how prospects were seeking information. Both schools discovered that most of their web traffic was generated after traditional business hours. Rockhurst deployed an EduBot, known colloquially as "Kaycee," for its undergraduate programs.

Kaycee, which is powered by <u>IBM Watsonx Assistant</u>,²⁸ is a specialized digital assistant that serves as a crucial point of contact for Rockhurst's undergraduate prospects. Kaycee engages in hundreds of conversations every day, answering questions and converting prospects into applicants. Rockhurst's digital assistant has saved the university more than 260 employee hours per month. Of the prospects who reach the admissions page, a remarkable 67 percent proactively engage with Kaycee for assistance.

DX AT WORK

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zoom

DX at Work: AI Aiding Grading

Zoom has <u>integrated Al-powered tools</u>, such as automated transcription and live captioning, into its calls, which are often used in educational settings. These tools make it easier to grade students' work and provide constructive feedback by recording and transcribing lectures or student presentations, which are traditionally time-consuming and/or expensive jobs.

The same technology also enhances accessibility, allowing for real-time captions and post-meeting transcripts in multiple languages. Getting AI to do tasks such as transcription, recording, and translation allows educators to focus more on personalized instruction rather than administrative tasks.



DX at Work: Transforming Learning for Disabled Students

Al, when trained on data that includes people with disabilities, serves a wider base of users and can help bridge the disability divide. <u>Microsoft's Al for Accessibility program</u>²⁹ empowers researchers, startups, nonprofits, and assistive technology companies around the world to push the limits of accessible technology.

An estimated 1.3 billion people will need assistive technology (assistive, adaptive, and rehabilitative devices or apps for people with disabilities and the elderly) to support them by 2050. Generative AI represents a new, exciting frontier for technology to benefit people across the spectrum of disability. By relying on AI to craft new content from user input, generative AI can reduce the time, effort, and mental load needed to complete a task.

In its first five years, it has used AI to support the creation of tools such as Cboard, an opensource app that aids communication for people with speech and language impairments. Another project removes barriers for visually impaired people in India by converting textbooks into braille on demand through Vembi, a device specially designed for children.

Adobe is using learnings from the Readability Initiative to reinvent how people read and extract information from digital documents. Al can help students with disabilities and other struggling readers experience digital content in more accessible ways.

DX AT WORK

cisco

DX at Work: AI Tutoring for Real-Time Student Support

<u>**Cisco**'s Webex platform</u> integrates Al-driven intelligent tutoring systems that offer real-time support to students outside of regular class hours. These Al tutoring systems adapt to the individual learning pace of students, offering personalized assistance and resources tailored to each student's needs.

This helps educators ensure that students receive continuous support, particularly those who may need extra help understanding certain concepts. The AI integration has increased student engagement and improved learning outcomes by providing continuous, personalized support beyond the classroom, adapting to various learning styles and needs.



⊘ databricks

DX at Work: Data, Delivered

Western Governors University (WGU) was founded in 1997 by 19 US governors as a nonprofit, all-online university, and now has more than 180,000 graduates. WGU has made a commitment to understanding its students, employees, and educational platforms through data. **Databricks** helps <u>Western Governors improve student success</u>³⁰ by providing a onestop for data access. This enables a better overview of progress for staff and students alike.

WGU uses data not only to deliver education content, but for real-time assessment of each student's learning experience, with real-time data systems to inform teachers what is working, and to intervene directly with students where the process is not working. WGU also applies data analytics over time with AI models that help make the learning experienced as effective as possible.



🙂 twilio

DX at Work: Reaching Students Through University and Beyond

Timely and relevant communication is essential to support students, but in a fragmented world of apps and messaging services, that can be complicated. <u>Twilio's products allow</u> <u>institutions</u>³¹ to send broadcast notifications over multiple channels such as SMS, voice, and email, to update students on important deadlines, course schedules, and campus events.

After graduation, schools can tailor giving appeals based on each alumni's interests, previous giving patterns, and affinity for specific programs. And with AI, they can identify which alumni have the highest chance of giving and automatically prioritize them for outreach.

Conclusion

Al is already present in everyday life for millions of students worldwide. Bringing Al into the classroom in a thoughtful, ethical way will not only enable them to gain the skills necessary for the future of work, but also keep them interested, motivated, and learning. Al tools are also uniquely well-placed to support learning beyond the classroom, as well: the future of work won't work without lifelong learning. And these new skills should be available to everyone, with a raft of Alpowered support systems to make learning accessible anywhere, any time.

Endnotes

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