THE STATE OF THE FUTURE

THIS YEAR IN
Education

Our society never stops changing, and we never stop learning. As a result, our education systems are under constant pressure to incorporate new ideas and new technologies, which ultimately allows us to develop innovative means of inspiring the next generation.

THIS YEAR IN EDUCATION

In 2016, advances in our curriculums and educational policies allowed us to educate individuals in ways that were unattainable in previous eras. Simultaneously, through developments in information access and breakthroughs in computing technologies, we gave the next generation the opportunity to learn without limits and innovate the world that they want to live in.

BY THE NUMBERS

750+ MILLION
ADULTS WHO ARE ILLITERATE

8%
COMPANIES NOW USING MOOCS

6.7%
OF THE WORLD HAS A DEGREE

$107 BILLION
GLOBAL E-LEARNING MARKET

256
ACTIVE PROGRAMMING LANGUAGES

EXPERT CONTRIBUTORS

Jeremy Johnson
Co-Founder
CEO of Andela

Jeremy Johnson founded Andela with the goal of training 100,000 world-class software developers in Africa over the next 10 years. Prior to Andela, Jeremy co-founded 2U, one of the fastest growing education technology startups in history, which creates online degree programs for top-tier universities.

Reshma Patel
Executive Director
Impact Network

Reshma Patel uses Impact Network to empower teachers across Zambia by providing them with daily lessons delivered through a tablet and projector. Impact Network serves over 2,100 students at a cost of only $3 a month per student (a fraction of the cost of government schools).

Zach Sims
Co-Founder
CEO at Codecademy

Zach Sims is the Co-Founder and CEO of Codecademy, which has taught millions of people how to program through its online portal. Ultimately, they hope to use their team to shape the online learning experience of the future.

At the Summit on Computer Science Education in September, the White House announced a new initiative that will give every student from kindergarten through high school access to a computer science education. Specifically, the program will provide each student with the in-demand computer science skills that are needed to join the world's workforce and, thus, help prepare them to build the world of tomorrow.

THE AGE OF THE COMPUTER LED TO A NEW AGE IN EDUCATION

NEW LANGUAGES WERE BORN

In 2016, lawmakers revolutionized education by adding another fundamental to the three conventional skills of reading, writing, and arithmetic: programming. A number of proposals were put forth in various countries that enabled students to enroll in courses on programming languages such as JavaScript and Python instead of enrolling in traditional foreign language courses.

In what has been called a "life-changing decision," the European Union's ministers of Science, Innovation, Trade, and Industry decided to give individuals free access to science papers. This would legally only impact research supported by public and public-private funds, which are a vast portion of the papers produced annually; however, the goal is to make all science freely available by 2020. Ultimately, the commitment rests on three main tenets: sharing knowledge freely, open access, and reusing research data.
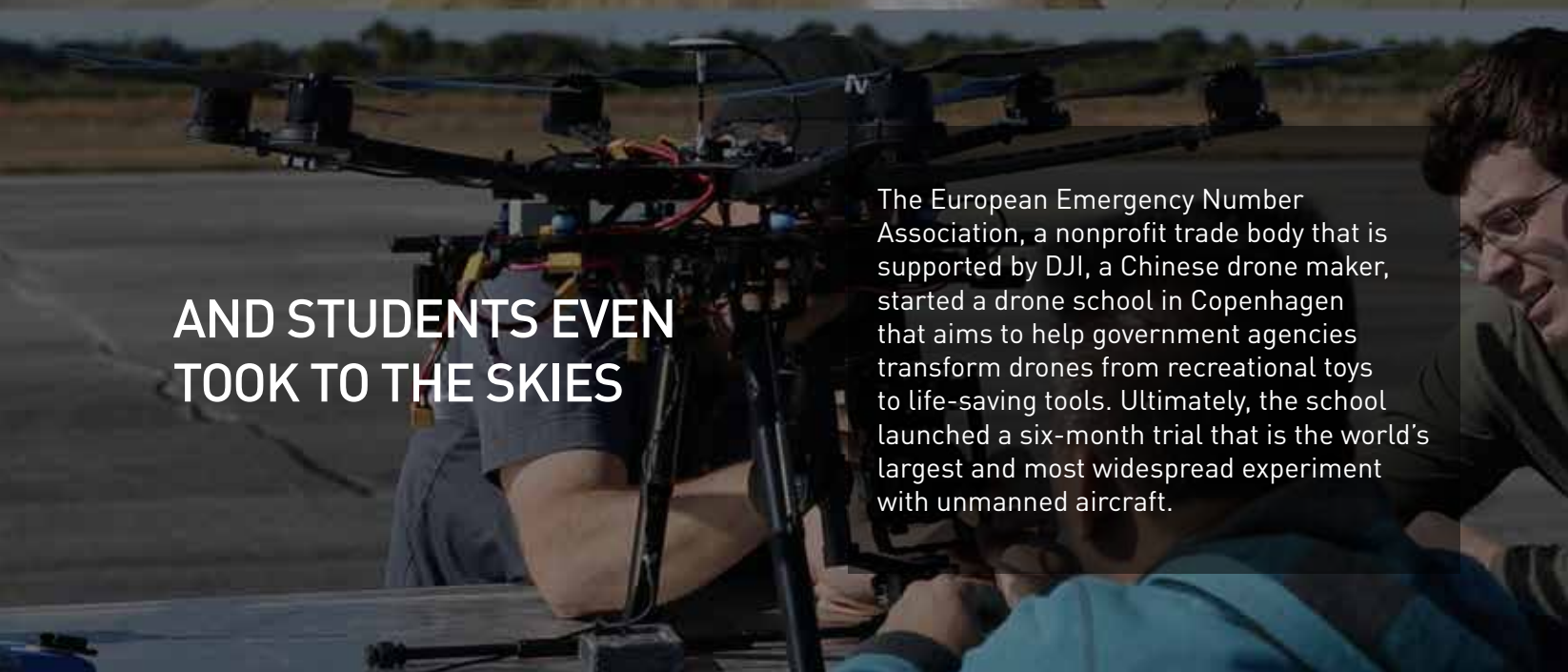
AND KNOWLEDGE BECAME FREE FOR ALL

Japan Airlines started using the Microsoft HoloLens in August to teach trainees how a jet engine works. Their technologies use mixed reality to blend realistic 3D holograms of an engineer right in front of students and allow those in training to easily access and study the different parts of the jet engine. Engineers can even adjust the engine's size to actual scale. Through these innovative teaching methods, Japan hopes to reduce training costs.

OUR STUDENTS ENTERED THE VIRTUAL WORLD

AND STUDENTS EVEN TOOK TO THE SKIES

The European Emergency Number Association, a nonprofit trade body that is supported by DJI, a Chinese drone maker, started a drone school in Copenhagen that aims to help government agencies transform drones from recreational toys to life-saving tools. Ultimately, the school launched a six-month trial that is the world's largest and most widespread experiment with unmanned aircraft.

JEREMY JOHNSON
ON EDUCATION

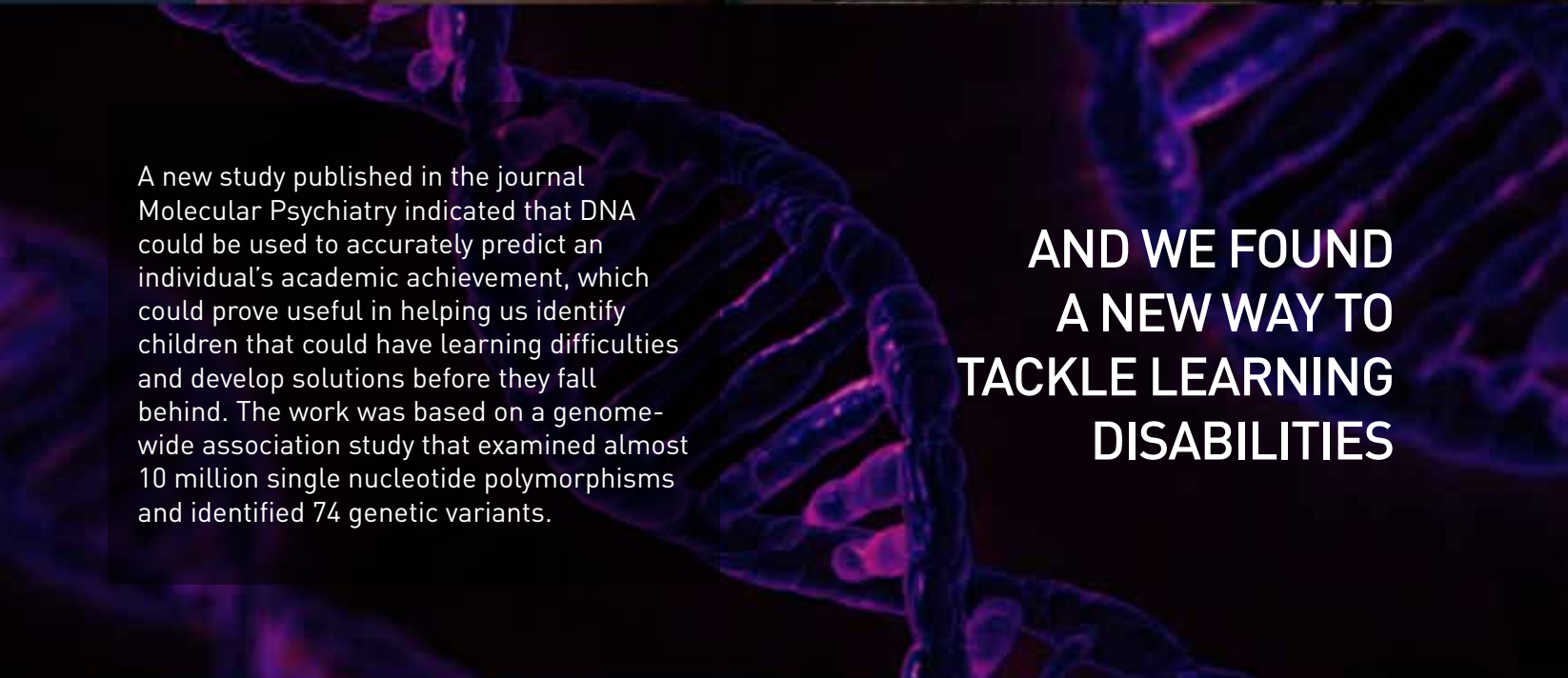Education is important because it is one of the most powerful forces for bringing people together and helping them connect. So increased access to education translates into increased humility and understanding that our culture is not **the** culture, that there are a lot of different ways to approach the world. In short, education leads to increased tolerance.

OUR CLASSROOMS LITERALLY DISAPPEARED

In February, the SP Jain School of Global Management announced plans to launch its undergraduate and graduate classes in virtual reality. The school's president explained that the decision to have courses with virtual reality as a major component was prompted by the changing needs of business. The school notes that, as virtual reality becomes more ubiquitous, students need to learn how to work in the virtual world as well as know how to work the old-fashioned way — and that means being fully immersed in the virtual world throughout schooling.

A new study published in the journal Molecular Psychiatry indicated that DNA could be used to accurately predict an individual's academic achievement, which could prove useful in helping us identify children that could have learning difficulties and develop solutions before they fall behind. The work was based on a genome-wide association study that examined almost 10 million single nucleotide polymorphisms and identified 74 genetic variants.

AND WE FOUND A NEW WAY TO TACKLE LEARNING DISABILITIES

ZACH SIMS
ON RESEARCH DATA

Codecademy is building a database of all student actions taken, so that we can draw more accurate conclusions from the data about how people learn. There has not been too much consistency in a lot of education research precisely because of a lack in data, which is why most of the interesting stuff will come after we establish new products that are able to collect data.

THE WORLD'S INFORMATION BECAME AS CLOSE AS A KEYBOARD AWAY

MIT's OpenCourseWare website is leading a revolution in education. And this year, it turned 15 years old. The website hosts over 2,300 courses from MIT — it has video lectures from professors, course materials, study guides, and even full textbooks available for free and instant viewing.

If that's not impressive enough, the website is still growing. Each year, the school adds an additional 120 courses and a host of new interactive features in an attempt to provide individuals worldwide with free access to an education. The school also has a host of materials that are focused on engaging elementary and high school students.

MIT's courses are focused on science, technology, engineering, and math (STEM). And given the increasing influence of science and technology on our lives, having a sound understanding of the STEM fields is a vital part of being an effective and productive member of society. Those working in STEM and associated careers have unanimously welcomed this commitment, as it doesn't just make for a more educated population — open access courses also allow us to make better workers.

TECHNOLOGIES CREATED NEW WAYS FOR STUDENTS TO SEE AND SPEAK

The Urban Arts Partnership, an organization that works with thousands of students to help ensure that they have the skills necessary for life post-graduation, brought a host of students together at a "Future Forward" event to discuss how art and technology could be united to make more effective students. Ultimately, the project seeks to push the boundaries of what's possible in creative expression, allowing students to really expand their minds by using art and technology to find new ways to speak and be heard.

Ahshok Goel, a professor at Georgia Institute of Technology, revealed in May that he has been employing a robot as one of his teaching assistants. "Jill Watson" did the work of a regular teacher's assistant for Goel, answering students' questions in a forum, reminding students of upcoming important dates over email, and communicating on a daily basis. Notably, the AI did so in a way that was so human, students never realized that they were talking to a robot. To train the robot, Georgia Tech researchers exposed Jill to over 40,000 postings in the discussion forum "Piazza," and he taught her to use previous responses to reply to related questions.

AND THROUGH TECHNOLOGY, WE EVEN RE-CREATED OUR TEACHERS

RESHMA PATEL
ON EDUCATION TECHNOLOGY

"There's a lot being done with different advancements in technology that could help create better assessments in the future. For example, responsive assessments. Students could come to class, take a test at the beginning of the day, and software creates customized education plans for that student for that day based on how they did on the test. So if a student took a test on fractions, and they're having trouble with getting factions down to common denominators, the lesson would be all focused around improving that aspect.
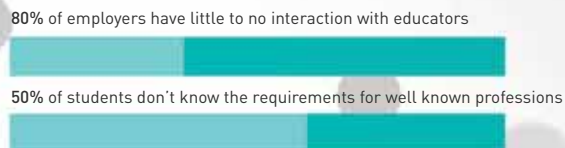
THE NEXT EVOLUTION *of* LEARNING

HOW EDTECH STARTUPS ARE DEMOCRATIZING EDUCATION

YOUNG PEOPLE ARE POISED TO ENTER A CUTTING-EDGE DIGITAL WORKFORCE.

60% of today's schoolchildren will be employed in jobs that don't exist yet

WHAT IF EMPLOYERS WERE MORE ENGAGED WITH THE EDUCATION SYSTEM?

80% of employers have little to no interaction with educators

50% of students don't know the requirements for well known professions

WHAT IF WE COULD CLOSE THE COLLEGE COMPLETION GAP?

7% of students from the lowest income bracket graduate college

72% of students in the top income bracket graduate college
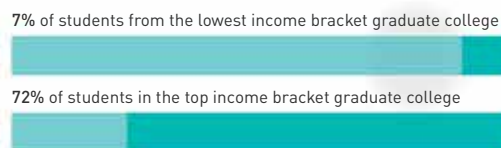
TODAY'S CLASSROOMS ARE MORE CONNECTED THAN EVER BEFORE.

of teachers have one or more computers in the classroom every day **68%**

93% of those computers have access to the internet

DonorsChoose

DonorsChoose is a nonprofit organization that connects high need classrooms with individuals who are willing to donate to fulfill those needs. To date, well over one million citizen philanthropists have made contributions

Code.org

Code.org is a nonprofit that encourages and enables students to learn computer science. The organization has partnered with everyone from Disney to Microsoft to make coding more fun and more accessible

Coursera

Coursera provides universal access to the world's best education by partnering with top universities, organizations, and governments to offer free courses online. Partners include Duke, Penn, John Hopkins, and Stanford

edX

edX began as a joint venture between MIT and Harvard to offer free online courses from top universities. The nonprofit now features classes from Berkeley, Georgetown, and the University of Texas too

VR for Good

Launched by Facebook and Oculus, vr for good is a program that connects students with professional virtual reality filmmakers to create 360 films about their communities. For the pilot, vr for good will partner with nine SF Bay-area schools with underrepresented STEM programs

DreamWakers

Co-founded by Monica Gray and Annie Medgalia, DreamWakers is a nonprofit that uses free video chat services like Skype and Google Hangouts to bring diverse and dynamic leaders into high-need public school classrooms

THE TIMELINE

2020
All Scientific Papers Become Free Under EU Proposa

All publicly funded scientific papers published in Europe could be made free to access by 2020 under a reform ordered by the EU's science chief, Carlos Moedas.

2022
Students Learn in the Virtual World

"The Earth's atmosphere, what it s like on the Moon, what the landscape in Germany looks like...soon, kids will put on VR goggles and really see that. They will actually experience these things in a virtual world.

Reshma Patel

2024
Grading Goes to Smart-Devices

All students and parents will have an app that allows them to immediately see all grades and all of the learning progress. This may come even sooner, as smartphones are already ubiquitous.

Jeremy Johnson

2025
Dramatic Increase in Remote Learning Experts

Experts predict that virtual reality and augmented reality will increase remote learning and, as a result, classrooms will start to disappear.

2026
Worldwide Education Access

"In 10 years, we will have a world where everyone will have access to internet. Lots of institutions will continue to make their content available and MOOCs will be commonplace.

Zach Sims

2030
Human Brains Connect to the Cloud

The ability to back up our thoughts and memories using computers will increase our learning potential dramatically. This will all be possible via nanorobots in the capillaries of our brains.

2030
We Will Enhance our Minds with Chemistry

Predictions assert that, by 2030, advances in chemistry will allow us to use drugs and similar methods to alter and improve our students' minds to optimize their brains for learning.

2030
Brain Imaging Revolutionizes Our Teaching

The use of brain imaging will allow us to fine-tune education by testing what modes of teaching work best. This will be possible, as the images will allow us to actually see how various ways of teaching alter the brain.
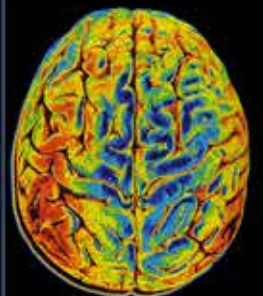
2031

Personalized Life-Long Education

"You're going to start seeing dramatically enhanced personalization. Students will spend a lot of time individually engaging teachers, and it'll feel like one-on-one tutoring, but it will all be virtual.

Jeremy Johnson

2031

Our Teachers Become AI

Computer scientist Eric Cooke notes that, in the next 15 years, intelligent machines will largely replace human teachers.

2035

Artificial Microbes Give Us On-Demand Information

Artificial microbes will give us specific and temporary comprehension capabilities: i.e. they could permit an individual to temporarily understand and speak a foreign language fluently.
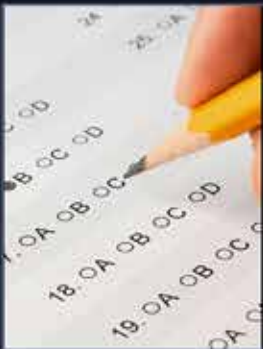
2036

Significant Reduction in Traditional Classrooms

"In 20 years, you'll see a lot of brick and mortar education institutions go away. Top universities will be fine, but the middle-tier institutions will be in trouble.

Zach Sims

2036

Exams Become Nearly Obsolete

Over the next 20 years, experts predict that traditional methods of testing will be abandoned, and we will begin to focus on more holistic assessments.

2043

A New Model of Education

"Education will be a pervasive part of our lives. We have constant access to all the world's information through our devices, so education will become more omnipresent as we continue to evolve.

Jeremy Johnson

2050

Brain Imaging Revolutionizes Our Teaching Methods

By 2050, futurists assert that schools will no longer teach children to read and write. Brain-computer-interfaces will make those skills outdated and useless.

2059

Direct Neural Interface to Information

"You will have a direct link to Wikipedia in your brain, and as a result, memorization will become irrelevant.

Jeremy Johnson