



# Education

Digitisation

ReShape Co. 2020

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Revised 1/11/20  
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## Overview

Education that leverages digital technology and internet connectivity to aid the learning process is no longer simply an advantage for schools and educators that choose to implement it, but a strong necessity as the Covid-19 pandemic continues to unfold and forge a 'new normal'. The Digital Education market is projected to be worth [USD 33.2 billion by 2025](#), a trend which has been accelerated by increased internet penetration around the world, reduced infrastructure costs, increased scalability using online learning and growing demand for microlearning.

## Industry trends

- Science and technology courses hold the largest segment of the market for online coursework as the increased adoption of Internet of Things (IoT) in leading companies demands a highly digitally literate workforce to process data and design algorithms. Computer science and programming courses, accessible through platforms such as [DataCamp](#) and [Codecademy](#), are a popular pathway to bridging that demand.
- The rise of Massive Online Open Courses (MOOCs) that are often available free of charge and led by renowned university professors is being accelerated by demand for high-quality instructor-led education, having [reached 110 million learners by 2019](#). Aside from offering free access to a wide range of course content, leading platforms such as Coursera, edX or FutureLearn now offer microcredentials such as certificates of completion, as well as fully developed and accredited online degrees. These options may offer solutions to remedying educational inequalities and are likely to continue to grow as the costs of traditional higher education skyrocket - in the US alone, the [price of college-level education is rising almost 8 times faster than wages](#).
- The need for lifelong learning is another factor driving demand for online education - the current 4th Industrial Revolution may impact [up to 50 percent of jobs](#) and professionals wishing to remain competitive in their sphere need to continuously re-skill. According to research by the World Economic Forum, the [top three emerging roles by 2022](#) will be data analysts and scientists, AI and machine learning specialists, and general and operations managers.

## Thought leadership

### The need to reinvent educational institutions

A [2017 report](#) by the World Economic Forum concluded that the world's education systems are failing our children by not preparing them for the workplace of the future. An estimated 65% of children entering primary school will have jobs that do not yet exist and the overwhelmingly outdated and static systems currently in place only work to exacerbate the skills gap and unemployment in the future workforce. The report, compiled by business leaders, policy-makers, unions, educational institutions and academics, puts forward eight key practical suggestions for aligning education with the demands of the workplace of the future. The following list is a summary of some of the key findings and opportunities for making the most of available technologies.

- 1.** Developing 'future-ready' curricula - partnering with local educational institutions to ensure that curriculum development is informed by market demand for skills, delivering interventions that strengthen STEM skills, aligning microcredentials with national qualification frameworks, broadening assessment beyond test-based approaches.
- 2.** Digital fluency - the report highlights a greater need for digital literacy and ICT skills among teachers and current workers; technology skills in the workplace can be fostered through work-based learning and externships for students.
- 3.** Open-sourcing education - the authors advocate for the adoption of training innovations and alternative learning routes (challenge-based learning, hackathons). Governments working alongside the private sector should support testing scale-up of education innovations e.g. in Ghana, the USA and France schools are pioneering short coding courses based on peer-to-peer teaching, project-based learning and gamification.

## Addressing student needs

In the 2018 edition of the Programme for International Student Assessment (PISA) 340,000 students in 51 countries were sent an ICT survey with specific questions on technology use in classrooms and its effects on learning outcomes. The key findings from the intervention, analyzed in [this McKinsey article](#), are summarised below.

- Device type matters - some types of devices are associated with worse student outcomes, for example - students with tablets generally perform worse in the reading, maths and science assessments than students with laptops, but students with laptops also perform worse on the math sections than those who do not use personal electronic devices in the classroom.
- Geography matters - tech use is associated with higher student outcomes in the US than other regions but the usefulness of certain devices varies across regions e.g. interactive whiteboards are very effective in non-EU Europe but counterproductive in Latin America. The discrepancy is most likely due to learning curves in the adoption of devices.
- Who is using tech matters - the best results are found when teachers alone use devices and the worst are when tech is solely in the hands of students.
- Intensity of adoption matters - students who use tech intensely (more than 60 minutes of use) or not at all perform better than students with moderate use. Optimal device time varies by region.
- School systems matter - the overall performance level of a school system cannot be underestimated as in low-performing school systems, tech is perhaps unsurprisingly associated with worse results.

## **Solutions for Schools**

### Time-saving strategies with the help of tech

The workload and working hours required of school teachers has been on the rise in recent years. A [McKinsey study](#) found that teachers in four countries with high adoption rates for education technology (USA, UK, Canada and Singapore) work approximately 50 hours a week, with only half of that time spent in direct interaction with students. Given that many of the administrative tasks expected of educators can now be automated,

technology can transform the ways in which teachers allocate their time to support student learning.

- Preparation: using technology to improve lesson plans and optimize learning approaches, making use of software to assess students' understanding, suggest lesson plans and group students according to learning needs.
- Administration: utilizing software that can automatically fill out forms, maintain inventories of materials and automatically order replacements - some of the fastest-growing school management systems in recent years have been [Alma](#) and [Brightwheel](#).
- Collaboration: [international comparative studies](#) show that high-performing school systems invest in peer coaching and collaborative lesson planning (e.g. [leerKRACHT Foundation](#) in the Netherlands) to improve student outcomes.

#### Institutional platforms & resources

The need for user-friendly and engaging online learning opportunities has become even more paramount during the pandemic - with many school districts still hesitant to deliver in-person instruction, schools are faced with adopting institution-wide systems and platforms in order to facilitate that transition. The following list includes a number of suggestions for digital learning and collaboration platforms that may be useful to educators:

- Microsoft Teams - [Office 365 A1](#) is free for school districts and includes all the standard web apps necessary for remote learning.
- [Microsoft Accessibility Features](#) offer learning tools and solutions for students with disabilities.
- [Google Classroom](#) for online organization and collaboration.

| Suggestions for interactive learning platforms   |  |   |  |
|--|--|---|--|
| Assessment tools   | Video/<br>screencasting tools  | Blended learning<br>for Science &<br>Maths  | Blended learning<br>for Arts &<br>Languages  |
| <a href="#">Formative</a> , <a href="#">Google Forms</a> , <a href="#">Quizlet</a> , <a href="#">Socrative</a> | <a href="#">Edpuzzle</a> , <a href="#">Explain Everything</a> , <a href="#">Educreations</a> | <a href="#">Gizmos</a> , <a href="#">Desmos</a> , <a href="#">Dreambox</a> , <a href="#">Khan Academy</a> | <a href="#">Busuu</a> , <a href="#">Gojimo</a> , <a href="#">ReadWorks</a> , <a href="#">Twinkl</a> , <a href="#">Writable</a> |

Further resources on best practices:

- [Making the transition to remote learning](#) by Microsoft
- [Distance learning options & tips](#) by Google

## Solutions for Higher Education

### A change of strategy

The rising democratization of education, demands for lifelong learning and exponential technological improvements in cloud-delivery systems, video conferencing and learning management systems require that today's higher education institutions adapt to the needs of digitally native students. [BCG's Digitization Blueprint for Higher Education](#) outlines the following recommendations for embracing the digital education revolution.

- 1.** Digital Education & Research - universities must adopt a wide range of digital initiatives beyond online courses such as digitized pedagogy, dynamic accreditation and examinations, digital data access, digital communications, supporting monitoring and learning systems.
- 2.** Strategy, Operations & Partnerships - universities must adopt digitization as part of their overall growth strategy to transform existing systems and processes and enable innovation and entrepreneurship. These would be highlighted by partnerships with other universities, industry and community organizations.
- 3.** Facilities & Infrastructure - digitization must be built into the physical assets of each campus. Necessary improvements and features include user-friendly work-study environments, digital labs, campus-wide WiFi, wireless charging stations, outsourced data centers, smart and green buildings.

### Institutional platforms & resources

- [Higher Education Remote Learning Tech](#) by Microsoft
- [Distance learning solutions](#) by UNESCO
- [Online learning resources](#) (browse for sections relevant to higher education) compiled by the European Commission and available in 23 languages
- [How to Quickly and Safely Digitize Higher Ed Workflow](#) by EdTech
- [Remote Teaching Good Practices: Beyond the Tech](#) by Dartmouth