

The State of Education and Digital Disruption for the Future





Preamble

Digital first initiatives are taking the centre stage across all industries. So why should education be any different? Connectivity, adaptive learning, massive open online courses (MOOCs), digital classrooms, online certifications and distance learning programs are greatly successful.

E-learning has almost become an equalizer for education, and that's exactly what the industry requires today.

The need of the hour is simple: take learning beyond the four walls of a classroom. Thanks to K-12 schools that are increasingly adopting e-learning mechanisms, there has been no greater need than the one to transform digitally.

Enter new age learning systems. While many learning management systems (LMS) are creating ripples in the student community, building one is no easy feat. Setting objectives, finding the right talent to streamline processes and integrating modern tech are only a few hurdles that developers need to cross. But the endgame remains common: build interactive user experiences that keeps the learner coming back for more. An intuitive experience can make or break your LMS. So how do you build one that keeps your learners coming back for more?

Disrupt. The clock is ticking fast, and the obvious answer to stand out in the crowd, is to move at the pace of new age tech. Some of the top trends impacting education include conversational AI interfaces, robust cyber security measures and deep-learning enabled customization. CRM implementations are also on the rise, since they ensure a holistic, 360 degree learning journey, for both, the student and the teacher. Digital credentialing tech like block chain will also play a crucial role in data encryption and verification across portals.

Knowledge, well developed skillets and the power of critical thinking will define success for the upcoming generation. Learning management systems, thus, will play a huge role in shaping up the leaders of tomorrow. A well-integrated technological backend will be the driving force behind such extensively digital ecosystems, as innovation and disruption come together to create unforgettable learning experiences!

Ujjwal Gupta

Founder and COO, BenchPrep.

Introduction

Driving an industry towards impactful change is tough. It requires collaboration, adaptability and experimental strategies to bridge the gap. But most of all, it needs a vision: a vision to truly transform. This vision, across industries today, is led by digital transformation initiatives, where business, operational and technological competencies come together. These initiatives focus on building responsive, modern, agile and cost efficient ecosystems. Digital transformation is no longer an industry buzzword, but a very prevalent reality. Operational flexibility and optimized customer experiences is what it promises, and delivers.

The education industry has immense opportunity for growth today, and there are umpteen reasons to celebrate the strides learning technology is making. Ed-tech is a fast evolving sector as people realise the true value of a holistic learning environment and continue to invest in it.

Building a sustainable education program that is beneficial for both, the student and the teacher is complex. Tech integrations focusing on content, planning, pedagogy and training are a step towards simplifying that complexity. Disruptive tech, thus, is already a key piece of the digital puzzle, and we're only getting started. There's so much more to come!

"In today's era of volatility, there is no other way but to reinvent. The only sustainable advantage you can have over others is agility. Because nothing else is sustainable, everything else you create, somebody else will replicate."

-Jeff Bezos

Industry Snapshot



Ed-Tech spends crossed \$8.15 billion in 2017



Global investments in Ed-Tech crossed \$9 billion last year



The Asian education system reaches out to more than 600 million students. By 2020, APAC will represent 54% of the ed- tech market



India's online education market is expected to grow by 6 times to \$1.96 billion in the next year



Forbes estimates the market value for education to cross \$252 billion by 2020



The year over year growth of Ed-Tech for 2018 was estimated at 2.98%



813 Ed-tech companies in USA received funding in 2018. This is a straight up 30% increase since 2016



Around 23 million new learners signed up for their first MOOC in 2017, taking the total number of learners to 81 million



The global leaders for online courses include CourseEra (30 million users) edX (15 million users) and XuetangX (9.3 million users)

The Need for Digital Transformation



The future isn't what it used to be. The boundaries between the digital and physical world have already started to blur. Industries need to focus on continuous improvement, profitability, scalability and increased speed to market if they want to stay in the game.

More than 60% of CIOs across the world have already changed business models to adapt to digital first cultures, and the rest are on their way. They should be, because what we have today is a digital customer: someone who values connectivity, convenience and constant innovation.

The demand for dexterity and agility is thus, at an all time rise. Massive computing power, increased machine-to-machine interactions and hyper connectivity have all contributed to this. Mass extinctions don't happen without reason, and if you continue to stay averse to change, there's a good chance you might end up as the next Kodak.

Granted, digital transformation entails undertaking operational, governance related and major cultural risks, but the end outcome is always worth more. In the current technological landscape, means embracing these initiatives with open arms to drive mobility across the entire company and deliver strategic impact.

The global market for Digital Transformation is expected to exceed \$462 billion by 2024. It will grow at a CAGR of more than 18.5% in the next few years.

IDC predicts that by 2020, at least 55% of organizations will be digitally determined. New business models backed by digitally enabled products and services will take the lead.

"In 2007, we put our first course online. Today we have more than 6,000 courses and so much more. Grateful that the digital revolution allowed us to move from a classroom of 30 to a classroom for everyone. Innovators are insatiable learners!"

-Aaron Skonnard, CEO, Pluralsight



Education and Technology

A few years ago, education was confined to classroom learning. Not today. The term 'educational technology' has been around for more than a decade. Research states that spends in the Asia Pacific region have already been growing at a CAGR of 54% since 2011.

According to a Deloitte survey, 42% teachers use at least one digital device in class every day. 75% teachers and professors believe that digital content will replace books in the next five to ten years as computers, tablets and smartphones become student favourites. We're moving from blackboards to interactive digital boards that can you the answer to almost any question, as long as there's Wi-Fi.

India has a multi dimensional formal education system, with more than 260 million students, 1.5 million schools and 39,000 colleges for

undergraduate and post graduate studies. It's one of the world's largest educational hubs. Coaching classes and vocational centres form the base of the informal system. The country's online education market, currently at \$250 million is forecasted to see an eight-fold growth to \$1.9 billion by 2021.

Most of this growth will be driven by reskilling and online certifications, followed by primary education and test preparation programs. Higher education programs along with language & casual learning programs are still in the nascent stages of development, but have a significant potential to evolve. There are a total of approximately 1.5 million Edtech consumers today, and this number is expected to cross 9 million in the next two years. That's a lot. And that's why digital transformation matters.



90% children use digital learning tools at home



88% parents favour digital content that can be used at home to supplement learning at school



81% teachers believe that technology impacts education positively



74% teachers use digital learning materials to keep students engaged



Digital Education: Tech Trends and Perspectives

Aimed at keeping the students' curiosities alive and making the teacher's life simpler, this is what's trending in the Ed-tech space:

Personalized learning

In a class of twenty students and one teacher, not everyone will be on the same level of understanding. Especially for subjective concepts. **Tailoring content intensity according to various aptitudes** and retaining capacities is important. Personalised learning focuses on **differentiated techniques that recognize individual uniqueness, but deliver for all**. This is the biggest trend in online education today. A few examples include **techniques that help dyslexic students write through speech**, learn via audio books and take customised tests.

Immersive tech and Virtual Reality

Much of this disruption has already impacted the present ed-tech space, and one can only imagine what the future will look like. The possibilities are endless, as this approach is more **hands on** than traditional. It brings **the entire world to the classroom**. Though it costs a little more, the impact is significantly higher as well. **3D learning models, interactive field trips and simulations** are just the tip of the iceberg. **Experiential learning through gamification** has proved to have a positive impact on children and adults alike. It makes the entire process more engaging, giving users a chance to explore their imagination. Since most of this is smartphone ready, it is easily accessible. **4D AR flashcards for primary students, printable AR worksheets that 'pop out of textbooks' and lab experiments in 4D anatomy** are catching up.

mEducation

Smartphones are the preferred medium of consumer engagement, and it's the same with channels of learning. Children already know more about apps on the Play Store than they know about book releases. Mobile education has taken off to a great start in USA and APAC. The global market is already at **\$3.4 billion**. This is because mEducation simplifies **content through collaboration** and simulation of interactive software.

"Concepts like edX and online learning will transform education. This will completely change the world. I believe that people will move to online learning, both on campuses and worldwide. We have a real opportunity to be able to bring people around the world into our fold."

-Anant Agarwal, CEO, EDX

Digital Education: Tech Trends and Perspectives

McKinsey research states that 70% of children in the Asia Pacific region use mobile phones. 25% of send six or more text messages per day by age 10, and approximately 40% access the internet through their mobile phones.

Apple, Android, BlackBerry and Windows together offer 80,000 educational apps, as compared to 17,000 entertainment apps.

Internet of Things

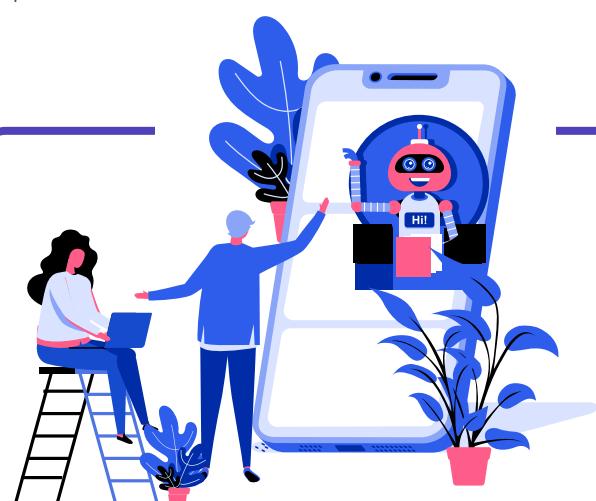
The number of energy efficient, interconnected smart devices is predicted to go beyond **20 million by 2021**. Monitoring student activity, creative problem solving and getting results in real time is very much possible thanks to the tracking proficiency IoT brings to the table.

Teachers have a real shot at understanding individual behaviour. Students have a chance to network globally while sitting in their own classroom if this tech is used judiciously. **QR coded textbooks are already being developed** by governments. That's not all. IoT can also be utilized for **campus safety** and efficient school management, with something as simple as **digitised cards**. **Interconnectivity** is the essence of disruption, and now's the time to implement it.

Artificial Intelligence and Big Data

Go back to sci-fi movies from the early 2000s and you'll see the futurists already told us what AI could do. Backed by **big data integration**, artificial intelligence is one such technology whose evolution pace has overtaken all others. It is changing the way students are interacting with information and ensuring that they build a strong learning foundation.

Right from automating basic admin activities like grading, to suggesting improvement areas for course structures, it's revolutionising the way education is perceived. **AI tutors are actively engaging with students** to fill in gaps, thus making the trial and error process less intimidating. In some cases, they also help students with **recommendations for what majors to choose**. We might not have reached a time where humanoids become our best friends, but we're walking that path.



NLP and Cloud are the key drivers for Artificial Intelligence in Ed-Tech. AI is predicted to grow at 47.5% through 2021 in USA alone. More than 60,000 schools have already started implementation



Driving Digital Disruption in Education

Design Thinking

A methodology that combines various backgrounds, perspectives and skills, design thinking acts as the foundation for impactful change. It breaks through the linear, 'one size fits all' approach. Education imparted under the traditional school of thought often lacks the creative spark, and that's where we need to plug this in. The five stages of design thinking are more focused on the learner, not the process. It's also more humanised than transactional, and has a greater chance at instilling character within students. Linear educational methods are more rigid in their structuring. Design thinking is not as firm, and better suited to inculcate curiosity. Creative confidence, adaptability and cultural awareness are all merits of this approach. These principles go beyond analytical subjects, and can be applied to social science as well.

DevOps

This methodology combines collaboration and experimentation. DevOps is what allows companies to disrupt at high speeds. Approaches like 'fail fast, learn faster' enable consistent innovation and agility, and that's the key to building memorable student experiences.. DevOps, in a nutshell, gives you speed, and direction. High quality agile software, reduced time to market and automated tools make learning even more fun. Training and certification programs will benefit the most from this approach. Cross skilling and collaborative work environments align IT goals with business processes to enhance digital transformation efforts and increase productivity.

Microservices

The demand for building well integrated educational apps is increasing. Building these apps on monolithic architectures is tedious. Enter microservices, that enable modernity, simplicity, productivity and organisational agility. Think LEGO. With independent APIs, continuous integration and quicker deployment cycles, the headache of rebuilding apps from scratch is mitigated. Businesses can plug individual services as and when needed.

It's easier to work with loosely coupled modules and then integrate them, as compared to entire monoliths. The process is also easily replicable, scalable and micromanaged.

If you bring in DevOps as well, common toolsets can be configured to deal with dependencies.

"Once you understand the fundamentals, you can actually move faster than you might think to make changes. Organizations can survive and thrive even more once they are open to change. Again, you have to understand the fundamentals."

-Kevin Johnson, CEO, Udemy

Challenges with Tech Intervention



63% schools don't have enough funding



41% teachers aren't trained to use technology



45% parents consider digital learning only to improve their child's skillsets

A fruitful journey is incomplete if there are no hurdles on the way. It's the same when you're trying to create industry wide impact. The first, and most extensive is the psychological resistance to change, mostly within parents. For them, more screen time equals less productivity. Perceptions like these are the hardest to debate with, and the absence of a digital first culture does not help. There is a great lack of awareness about integrated education within the masses, and a greater dearth of trained resources that can drive adoption rates.

There's a long list of executional hurdles too. Lack of enough electricity and computing power in developing countries tops the list. They might not even consider Ed-Tech if the basic necessities aren't met. It's all about the budgets.

What's Next?

Tech has the power to transform the current global educational landscape. Ed-Tech is still in its nascent stages of development, but schools and educational institutions are at the crossroads of opportunity if they implement this. Connectivity represents the future, and riding the connectivity wave is what will set apart the disruptive from the forgotten. As tech continues to advance, it will have a significant impact on the people's thought process, outlook and actionable steps. Learning, thus, needs to become more sophisticated, engaging and adaptive. Limiting it just to the classroom defeats the purpose of a digitally led world. Digital transformation is the present, not the future, and the sooner enterprises realize this, the faster they will achieve organizational excellence.



The BenchPrep Case Study

1. Summary

BenchPrep offers its users white-labelled and configurable branding options, right from the look and feel of the product to personalized learning pathways and user flows. With end-to-end program management, there are customized offerings provided for different learner segments. The proprietary cloud-based learning platform integrates everything in one place. Concrete, skill-based competency led frameworks aided by real-time analytics bring real world scenarios right at the learners' fingertips. BenchPrep develops solutions for credentialing bodies, associations and training companies, while maintaining security and data compliance metrics all across.

2. Disrupting digital learning

For digital learning to overtake traditional, there need to be comprehensive need-based solutions available for the learner. A configurable, gamified, engagement centric approach sets BenchPrep apart and enables interactive learning. The instructional design coupled with bite sized modules keeps painful system overhauls at bay. Over the last few years, BenchPrep has established strong user-platform relationships by helping learners understand their core strengths and improvement areas. The model also ensures accessibility and affordability, through web-apps and native applications. With predictive scoring and strength-weakness indicators in place, organizations like ACT are utilizing the BenchPrep platform to create online test prep programs for students. A mobile friendly format also opens up avenues for lifelong learning, and brings unified learning to the table, whether it is certification candidates, association members, or those receiving training in other settings.

3. Challenge and consumer need

Challenge

For a cross device, cross platform solution that provides real time user feedback, and ensures holistic learning through a digital-first medium

Consumer need

A smooth, streamlined end user experience that makes learning fun for consumers

Tools of Disruption

BenchPrep uses service-oriented architecture that is delivered on a private cloud via a combination of IBM bare metal, containerization and AWS. Each piece of the infrastructure is delivered across multiple data centers with enterprise scalability, reliability, and efficiency. The combination of Ruby, JavaScript and Swift, is used for varied delivery across services, tools, mobile, and web applications in a continuous three-week release cycle. Feature flagging is also incorporated to ensure constant platform improvements.

The iauro Advantage

A responsive, mobility aided web app platform was built for BenchPrep. The functions enhanced include skill assessment, adaptive learning and predictive analytics based instructional design that offers a learning experience unlike any other

Result

70% reduction in time to market

An overall 90% approval rating from instructors and learners both

Extended mobility, agility, cost efficiency, operational flexibility and significantly lower overhead charges

Winner of 5 leading industry awards, which include the Brandon Hall Group's Best Advance in Unique Learning Technology and Talented Learning's Best Continuing Education & Association Learning Systems



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