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Understanding India's National Competitive Advantage in the Education Technology Industry

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Introduction

Education Technology or EdTech is the concoction of IT tools and educational practices to deliver a more interactive, enhanced and personalized education. This Report has studied Indian's national competitive advantage using Porter's Diamond Analysis. The model consistsof five primary factors namely, Factor Conditions, Demand Conditions, Firm Structure Strategy and Rivalry and Related and Supporting Industries. These Factors are supported by two other factors namely Government and Chance.

EdTech is one of the fastest growing industries in the world at a CAGR of 16.1%. India, though the home to second highest number of EdTech start-ups in the world, has only a small share of the pie, i.e., 2.09 %. With the current situation of the pandemic, this industry is expected to grow at an unprecedented rate and many argue that the pandemic has been to EdTech what demonetization was to fintech in 2016.

Will India be able to become nationally competitive in the global EdTech industry? Will India become a global EdTech Player? Will EdTech be India's next export? These are some of the questions this report aims to find the answer to.

Factor Conditions

Factor Conditions is the most important determinant of the Porter's Diamond Theory of National Competitive Advantage. These are the elements that a country's economy can create organically for itself such as a large pool of Skilled labor, Infrastructure, Natural Resources, Technological Innovation, Capital Conditions, etc.

These various conditions relate to various types of resources that are either present or absent within a Nation's economy. There are essentially 2 types of resources that are classified as Basic Resources &

Advanced Resources. The former, as the name suggests, are useful natural resources and the availability of unskilled labor. The latter, also known as "Created Resources", include those resources that require specialization, skilled knowledge and expertise such as Capital & Human Resources, Infrastructure, Scientific Knowledge & TechnologicalInnovation.

According to Porter, the Natural Resources are less important as compared to the Created Resources. This is simply because competitive advantage of a country is furthered by upgradation through development of skills and creation of knowledge. Competitive Advantage is the result of world-class institutions that first create specialized factors and then continuouslywork to upgrade them. Thus, Nations succeed particularly in industries where they are good atFactor Creation.

**Note: - Due to the Nature of Edu-Tech Industry in India, Basic Resources will not be taken into account for the purpose of this study as Advanced Factors play a more significant role. **

Advanced Factors

Talking about Advanced Factors with respect to the Indian Edu-Tech industry, the Landscape is such that even in the earliest records of history, group education has been a significant part of Indian Society. From classrooms to smart devices, the medium of education has made a shiftin the paradigm from classrooms to online learning. India has seen a 14% increase in the addressable base for internet services in just one year. This adoption rate has paved way for many digital products and startups to render digitalized services, thereby giving rise topersonalization and convenience when it comes to school curriculum and non-classroom learning.

Capital Resources

From a Capital perspective, Edu-Tech is the most funded sector in India. Investors say that most of the Edu-tech industries are seeing a 3-5X rise in audiences to consume educational content and are enjoying a 50-100% growth in monthly revenues due to Covid.

VC investments in Edu-Tech startups have tripled in the months of January to July of 2020, from $310 Million a year ago to $998 Million this year. The investor focus has also favored lesser regulated segments such as tutoring and test preparation. The investment landscape is looking extremely bright in the current

VC* Investments in Edtech Startups (2015 - 2020 YTD**)

Year	No. of Deals	Amount ($M)
2020 YTD**	**31**	**998**
- Jan-Jul	31	998
2019	**42**	**404**
- Jan-Jul	24	310
2018	**42**	**664**
- Jan-Jul	19	54
2017	**30**	**176**
- Jan-Jul	15	111
2016	**33**	**194**
- Jan-Jul	21	126
2015	**26**	**81**
- Jan-Jul	15	60

Source: Venture Intelligence

*VC is defined as investments in companies less than ten years old

**Up to July 31, 2020

Top VC Investments in Edtech Startups (2020 YTD*)

Company	Investors	Amount ($M)	Date
Byjus Classes	Tiger Global	300	Jan-2020
Byjus Classes	General Atlantic	200	Feb-2020
Unacademy	Steadview Capital,	110	Feb-2020
Vedantu	GGV Capital, Coatu	100	Jul-2020
Toppr	Foundation Holdin	47	Jul-2020

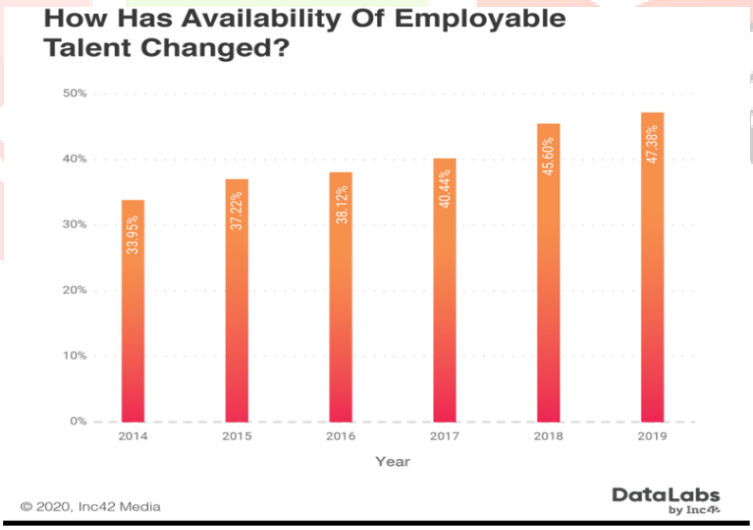
*Up to July 31, 2020 Source: Venture Intelligence

scenario for existing Indian Start-ups. BYJU's has topped the charts with $500 Million raised in 2020.

Over six years (2014 to 2019) more than $1.8 bn worth of capital has been poured into 194 unique Edu-Tech Start-ups in India. The Cost-effective nature of education in India along withthe growing expenditure towards online education are two of the most important factors behindthe increased investor confidence in Edu-Tech Start-ups in India.

Human Resource

The Edu-Tech industry acts as a catalyst to increasing skilled workers in India. This input- output relationship between the two is detrimental to the upskilling of unskilled as well as skilled workers thereby improving the talent pool and quality of Indian workers. Skill development through Edu-Tech focuses on updating the skills among the young and experienced workers from non-digital to digital needs. It also aims at re-skilling labour intensive industries and new-age Start-ups looking at technology such as AI, block chain, robotics, etc. Still, the hazard of skill deficiency in the country does have an adverse impact on the overall productivity of India's workforce. According to the ILO (International Labour Organisation), the output per worker in India was 49% lower than that of the world average in 2019. To tackle this, India needs to start the application of Edu-Tech at the early stages of learning itself. A recent report namely "India Skills Report 2019" has stated that the Indian
Workforce is estimated to increase to approx. 600 Million by the year 2022 from the current 473 Million, an overall increase of 27% with a likely change from 92% to 90% in the unorganised sector. More than half of the Indian workers will require reskilling to meet talent demands of industrial revolution 4.0 by 2022.



There has undoubtedly been a gap when it comes to skilled youth, especially in technical fields like engineering where there has actually been a dip in employable youth. Hence, providing refined courses and education focused on skilling and reskilling can uplift the overall workforce quality. There also exists a huge gap of disconnect between the colleges and industry and this is where Edu-Tech needs to step in to Bridge the Gap. Although companies such as Up Grad, Vedantu, Udemy and CollegeDekho have gone on a hiring spree of creating at least 3000 newjobs in the year 2020, the focus still needs to be on skilling and upskilling or the demographicdividend can soon turn into a liability in India.

Infrastructure & Technological Innovation

From an infrastructural point of view, problems with adequate connectivity and hardware in schools throughout the country prevent the Edu-Tech companies to reach children that need them the most. The objective of the National Education Policy (NEP) 2020 is to create standards of learning in public and private schools. However, the schools/universities in Indiahave not focused on universalization of infrastructure, thereby making the market unviable forprivate players to penetrate.

One extremely important trend in the Infrastructural growth of Edu-Tech in India is complemented by what is known as "Jio-Fication". Since its inception in 2016 Jio has been working tirelessly towards the future of Digital India, but it is only recently from the year 2018that it has impacted the consumption of data across the country. Not only has it made it more accessible to the backward areas of the country but also made digital consumption cost- effective. Due to its pricing strategy the competitors (TGN,Airtel,etc) had to follow suit leadingto more people favouring the digitalisation of India. Many schools/universities have very much jumped on the bandwagon creating breathing room for private Edu-Tech players. Moreover, the influx of capital from giants such as Google and Facebook guarantee an even brighter futurefor Digital India, paving way for Edu-Tech companies to step into the limelight. On the other hand, Reliance have themselves strategically invested in Edu-Tech Start-Up Embibe for $180M with the objective of improving the Edu-Tech Infrastructure in India.

The latest technological advancements in innovation and science have ushered a robust tech- powered educational vista, where the latest breakthroughs in AI, IoT, etc seemingly redefine the way we speak and learn. The rise of the Edu-Tech sector is merely an augmentation of thistechnological optimization. The e-learning industry has been growing by 25 percent year-on- year. The primary catalysts of online learning are low cost of online education, ever-increasingsmartphone user base and greater employability proportions after concluding an online degree.Hence, Technological advancement and resulting innovations have been the most crucial factors in making Edu-Tech a feasible reality.

◊ Mobile Based Learning

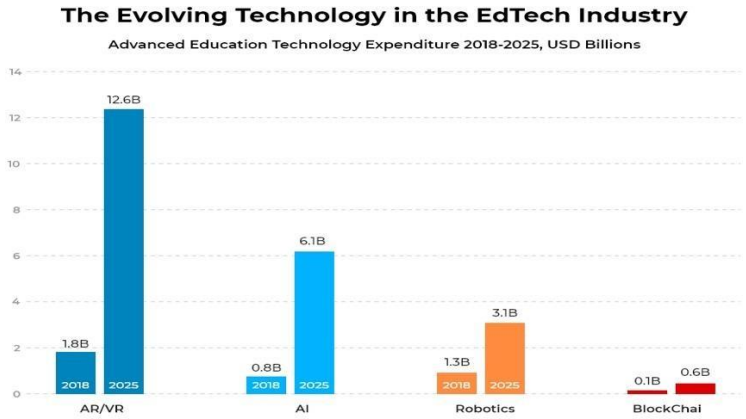
The Nielsen Primary Survey which conducted an extensive study in 2018 about the Indian subcontinent concluded that 57 percent of online learning audience relied on smartphones for consumption of educational content.

◊ MOOC's (Massive Open Online Courses)

These are designed with the objective of unlimited participation and open access through the web. Edu-Tech platforms today offer more than 5000 courses that are taught by educators with open access to all.

◊ Use of AR/MR/VR in learning

VR allows Edu-Tech users to engage with their study material directly whilst ensuring higher engagement and motivation to study. The Educational VR market in India is setto skyrocket at a growth rate of 55% and the Educational AR market by 82% in 2021. By 2025, the educational expenditure on AR/VR in India is projected to be $12.6B.



◊ Interactive Classrooms

Interactive classrooms allow students to be engaged in their learning by enabling a two-way conversation model between learner and the catalyst. Ed-Tech platforms offer courses for competitive examinations such as JEE, NEET, K-12, UPSC and GATEpreparation for students to participate in remote classroom discussions in real-time.

Demand Conditions

Demand conditions in the Porter's Diamond Theory of National Competitive Advantage basically means the size and nature of the customer base in that particular market and industry,in this case India and Educational Technology. The demand for Educational Technology and the evolution of the market and its dynamic nature will also affect the need for innovation andproduct development. The presence of high demand will create more opportunities for the company to grow and improve quality of the product and thus help in building a competitive advantage.

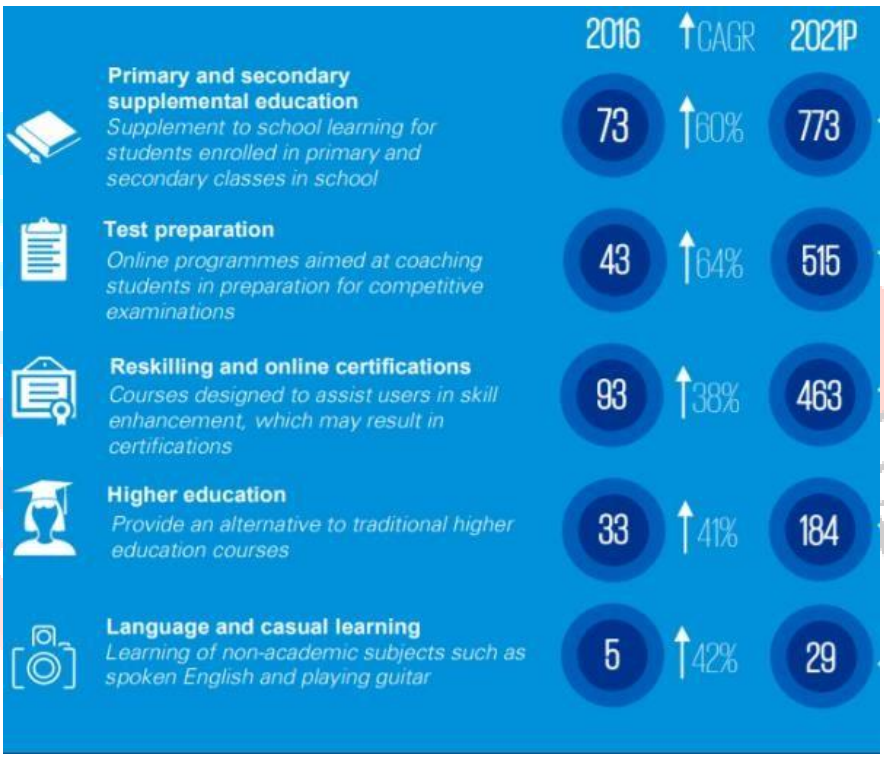
Size and CAGR

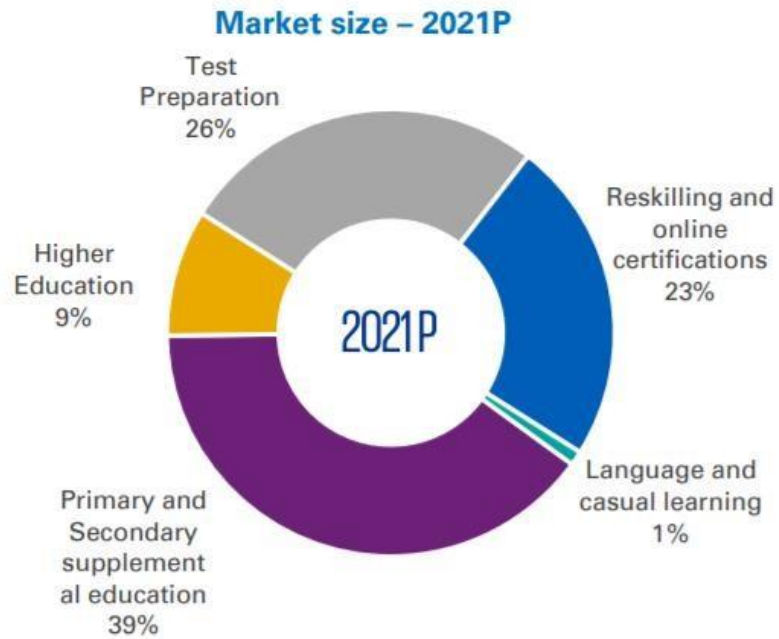
In India, Educational Technology is a booming industry and is a promising and viable option considering the quality of Govt schools, drop-out rates, absence of schools in small villages and towns, shortage of teachers, quality of teachers and many other such reasons. With the Internet penetration and access to the world wide web (statistics show India to have approximately 500 million internet users by 2023), it makes learning online a boon for childrenand adults alike. From the year 2014-2019 there has been an investment of USD 1.8 Billion inIndian EdTech start-ups. A study by KPMG in India and Google in 2017 said that the market stands at USD 247 million and is expected to grow to USD 1.96 billion till 2022., i.e. 8 times of its size. The paid user base for online education is estimated to grow at a CAGR of 44%, i.e.from 1.57 million Indians to 9.5 million in 2022.

Industry Structure

The Educational Technology industry is such that its main consumer base can be classified as a. students and b. working population. The EdTech industry can be split into various smaller divisions based on grade, utility etc. In India they are mainly split into, Primary and SecondaryEd, Online certifications, Test Prep, Higher Ed and Casual learning. Reskilling and Online certifications is the largest market at USD 93 million. However, it is expected that by 2022 Primary and Secondary Education will be the largest market for the same.

India hones the second-highest number of EdTech Companies (327) and is led by start-up BYJU'S as it has the most venture capital raised. In recent news BYJU's just acquired White Hat Jr and clocked in 68 million USD. The other companies in India with considerable market share are Unacademy, Vedantu, Dexler Education, EduKart, Coursera and Meritnation.





Reasons for the High Demand in India

The Indian consumer demands for Educational Technology for a few reasons which I would like to discuss further in detail.

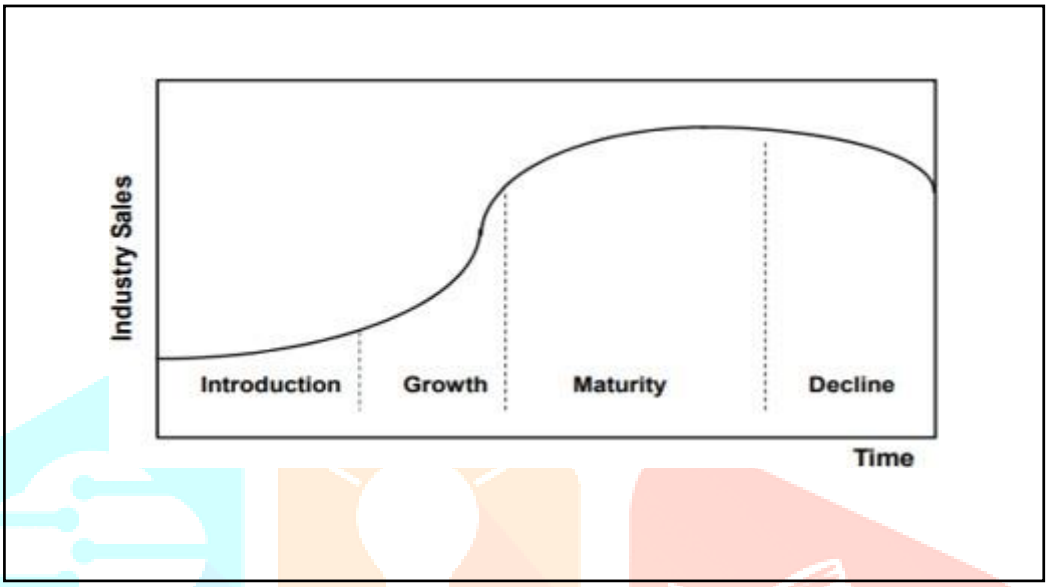
- The variety of study material, flexibility and convenience factor come out at the top. This also plays a huge factor for rural India as there is a significant difference in the education system and quality from urban to rural India. Indians may find the flexibilityand any time commencement factor very promising and convenient. It will enable themto study anytime, anywhere.
- It also acts as a low-cost alternative and there are statistics that go to show it is almost 53% cheaper than offline classes. The infrastructure cost is to a bare minimum if compared to that of physical schools and thus the overall cost of online learning, drops.
- It is very important to remain relevant and thus continuous learning and up-skilling yourself to remain employable is also one of the key points as to why adults use the online education platform. It is a dog eat dog world and in this competitive environment, Indians find constant need of training and upskilling which onlineeducation satisfies beautifully.
- The government launched the Digital India initiative which acts as a tool of encouragement and empowerment for all Indians. All Indians will want to be part of this initiative and a huge industry that will benefit from this initiative is the EducationalTechnology industry.
- A large part of Indian population is young, i.e. from the age of 15-40 and India is on its way to be the second largest middle-class population in the world. This becomes theperfect target market for online education.
- Almost every Indian has access to a smart phone or will have access to a smartphone in the near future which acts as a factor as now Online Education will be accessible. There are almost 850 million phone subscribers in India according to the Internet and Mobile Association of India and thus it is only a few years until the phone becomes a virtual platform for all Indians.
- The disposable income is also largely increasing which enables more Indians to have access to a smart device, internet and thus Online Education.
- The future also looks very positive and welcoming for this particular industry and a few characteristics we may see in this space are a multi-channel approach wherein companies try to create offline touchpoints for the services they offer online. The onlinelearning factor will have huge importance in the concept of continuous learning and thus upskilling from time to time to remain employable and lastly technology and artificial intelligence will see customised content and virtual labs.

However, all this said, after the pandemic the growth that the industry expected in 4 years hashappened over 6 months as now everything has moved online. 72% students across the word have stopped going to physical school and college and have moved online and thus the Educational Technology has taken a massive boom which will be covered in detail in the following parts of the report.

Firm Strategy, Structure and Rivalry

Industry Structure

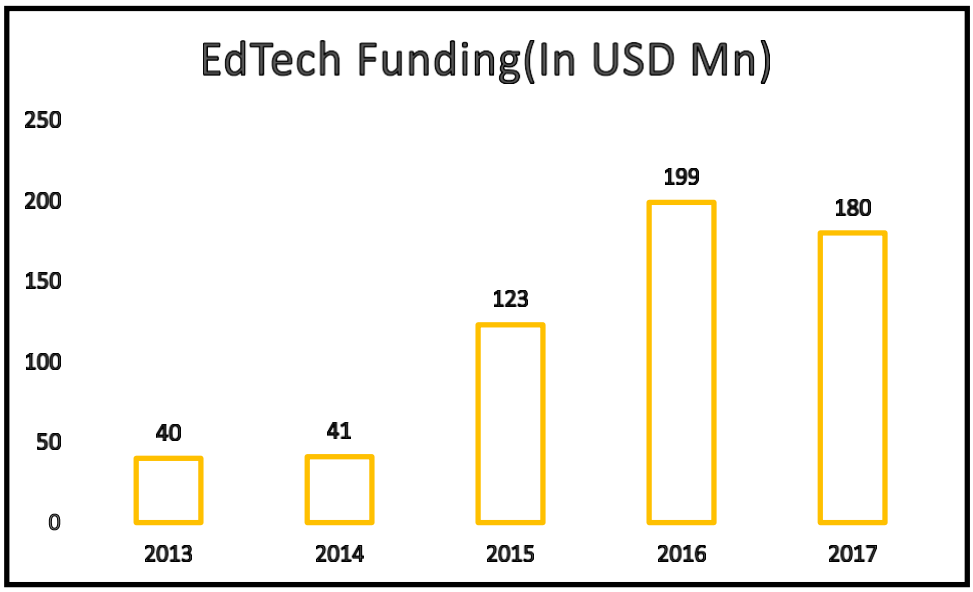
The growth of an industry's sales is studied to map out the life cycle of an industry and isdivided into four distinct phases namely Introduction, Growth, Maturity and Decline.



Source: Inc. Magazine.com

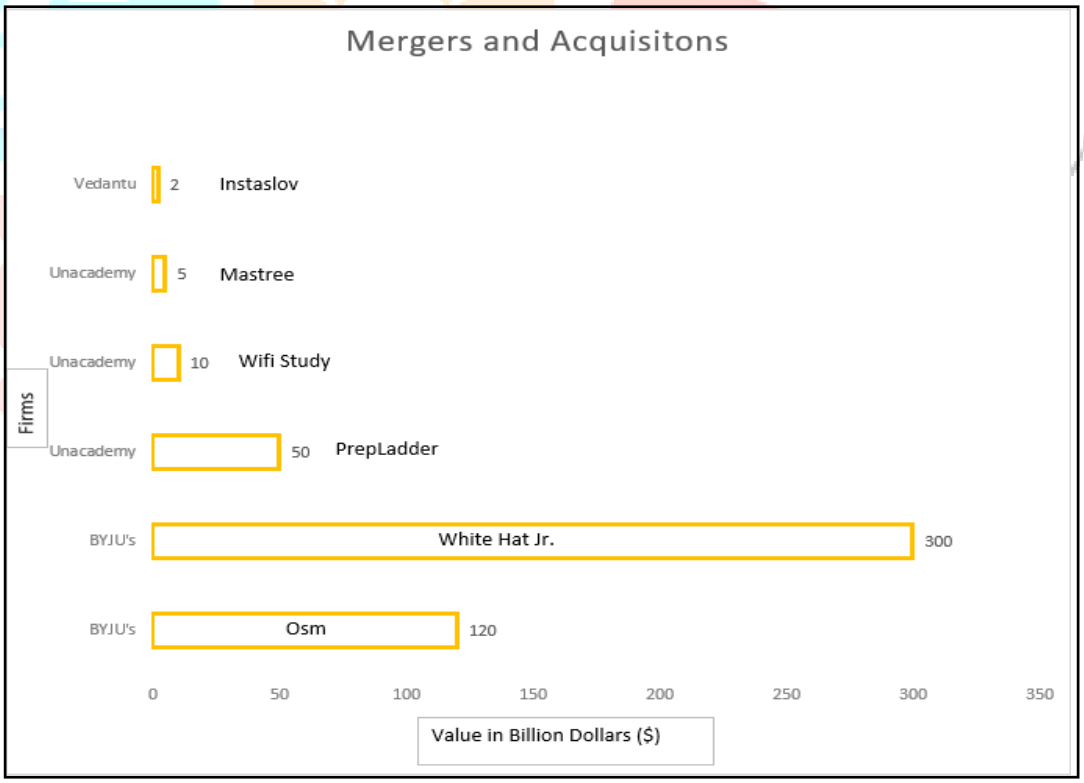
The EdTech industry is in the growth stage of the industry life cycle growing at a CAGR of19.6%.

1) **High Consumer Awareness:** In the growth stage, the firms enjoy a high awareness and adoption rate among consumers. Currently, 80% of the students in K-12 are awareabout EdTech and 60% are willing to pay for it (An Omidyar Network India, 2020).
2) **A pyramidal structure:** There are more than 4,450 EdTech Start-ups in India with only a handful dominating the market in each segment, with BYJU's being the world'smost valuable EdTech Start-up (An Omidyar Network India, 2020).
3) **Geographical Expansion:** The Global EdTech industry is expected to grow at 18.1 CAGR (Research, 2020) and therefore it becomes viable for the companies to start theirglobal expansion process and leverage the growing global consumer adoption. BYJUsis already planning to expand to the USA, UK, Australia and New Zealand.
4) **Investments:** There is enormous amount of capital infusion in the industry with a 5x increase since 2013 (Pre-COVID). According to the report H1 2020, EdTech was India's second-most funded sector after fintech and financial services, according to Your Story Research. Post COVID, EdTech ventures have received $686.32 million in21 funding rounds, a steep rise from $450 million in 87 rounds in the entire 2019 (Datalabs, n.d.)



Source: DataLabs.Inc

5) **Mergers and Acquisitions:** The Firms aggressively pursue Mergers and Acquisitionsto leverage the growing customer base and yield maximum profits as the industry moves to maturity stage. A total of 35 EdTech start-ups underwent merger or acquisition between 2014 to 2019 (Datalabs, n.d.)



Source:www.mergersindiainfo.com

Firm Strategy

This Growth phase has propelled the Indian EdTech Firms to incorporate a certain structure with the following characteristics:

Business Models:

There are primarily two business models adopted the EdTech companies, which also, to some extent, forms a basis for their further competitive strategies.

1) **Inventory Based Model:** This model includes in-house development of content by the firm itself. This model is usually adopted by firms delivering online coaching and competitive exam preparation.

2) **Market Place Model:** Some EdTech firms have adopted a market place model where they merely act as aggregators and match customers with service/content providers. They have a pool of industry and subject experts who curate exclusive content according to what they feel is the need of the market. The customers have a plethora ofoptions to choose from.

Pricing Model:

1) **Freemium Model:** Due to Price sensitivity of the Indian consumers, majority of the EdTech companies offer a freemium model to drive customer adoption.
2) **Subscription Model:** Some firms charge a monthly, quarterly or an annual fee fromcustomers for their entire product portfolio. Once the charges are paid, all the content becomes available for the consumer.
3) **Pay per course model:** In this model, the consumer is required to pay for each course/content that they buy. This is usually adopted due to the high cost of product development.

Competitive Strategy

1) **Product Differentiation:** In a product differentiation strategy, a firm seeks out to be unique in some attributes that are most valued by the consumers. Firms pursuingthis strategy follow a premium pricing and compete on the product quality. This strategy is common in Inventory Based EdTech start-ups, as there is a significant cost involved in product development. Online coaching platforms such as BYJU'sand Unacademy and Coursera in the Upskill and Online Certificates segment follow this strategy.
2) **Cost Leadership:** In a cost leadership strategy, a firm sets out to be the lowest costproducer in the industry. This kind of strategy is common for market place models.Udemy, Khan Academy, Toppr are few firms following this strategy.

Firm Rivalry

S.No.	Firms	Market Share (in million users)
1	BYJU's	40
2	Unacademy	30
3	Vedantu	25
4	Toppr	13
	Total	108
Total Market Size		260
Concentration Ratio		41.54

1. Concentration Ratio: This ratio is a toolused to gauge the intensity of competition in anindustry. It compares the market share of the four largest firms in the industry with the total market size. It ranges from 0%-100%. A 0% ratio indicates a perfect competition and a 100% ratio indicates a pure monopoly.

The Indian EdTech industry has a concentrationratio of 41.54 % which indicates low concentration and high rivalry among the players in the Industry.

2. **Fragmented Market**: The Indian EdTech Industry is highly fragmented. The industryis divided into small clusters, each targeting a particular segment.
3. **Niche based targeting:** The EdTech companies have taken a niche targeting approach.Each company has two or three main focus areas. The firms are however on an acquisition spree to broaden their targeting diversify their product portfolio.

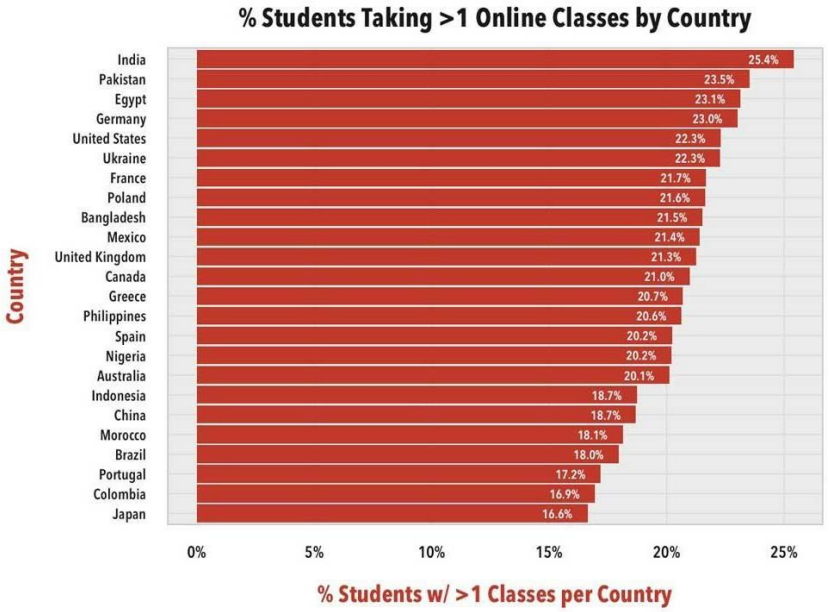
Sr. No.	Segment Targeted	Company	Average Price Range (INR)
1.	Online Coaching	BYJUs	10,000- 1,50,000
2.	Online Coaching	Unacademy	8,000-64,000
3.	Upskill and Online Certificates	Coursera	1000-8,000
4.	Upskill and Online Certificates	Udemy	300-10,000

4. **Customization:** The Indian Education system is predominantly based on rote learningand hand holding. To offer a value addition and compete with the offline sources of education delivery, EdTech start-ups develop highly personalised and interactive content with high quality interactive videos, one to one mentorship sessions, Doubt- solving sessions, assignments, tests and performance review.
5. **Leveraging the Learning Curve:** Due to the technical nature of education technology,firms that have been in the market for a long time such as BYJU's and Unacademy, have a huge advantaged in terms of customer data. They are able to invest heavily in the research and development of content that consumers actually want. This is a huge advantage for the existing EdTech players in the market. For example, Vedantu's Proprietary technology WAVE, tracks students' performance using 70 parameters.

Related and Supporting Industries

Competitive Related Industries:

a) Offline Educational Industry: Before COVID-19, educational institutes were bullish about their superiority to online education platforms. Many Indian universities, chose to stay away from these platforms and build their offline learning facilities better. Theytried to showcase that they were offering similar services on a more personal and interactive level. The Government of Karnataka (GoK) had gone so far as to ban onlineteaching for students up to class V, citing the digital divide in the country and the effectit had on mental well-being. Beyond COVID-19, educational institutes have the chance to compete against Ed-Tech platforms as they will look to portray that their service is pro collaborative, dissuades from screen time, more practical learning, and no networkand internet connectivity issues. Government policy has been a major boost for the offline educational industry in terms of competition with Ed-Tech. The New EducationPolicy 2020 addressed one of the major issues in the Indian education system which enabled Ed Tech start-ups to rise. Ed Tech creeped into India as a result of the convenience factor but also due to the lack of vocational courses and the lack of substantial courses for adults in the education system. NEP 2020 states that *"Use of schools/ school complexes beyond school hours and public library spaces for adult education courses which will be ICT-equipped when possible and for other communityengagement and enrichment activities"* and *"Every child to learn at least one vocationand exposed to several more."* While these pros are quite substantial and in favour of the offline education industry, there are countless factors in favour of online educationwhich simply cannot be discounted. Online education can be delivered at cheaper costswith various different types of media transferred via a single device. This makes it an invaluable resource because it could help facilitate rural education on a massive scale in a country like India. Online education has only been growing in India as seen by thechart below and offline education cannot compete with these numbers.

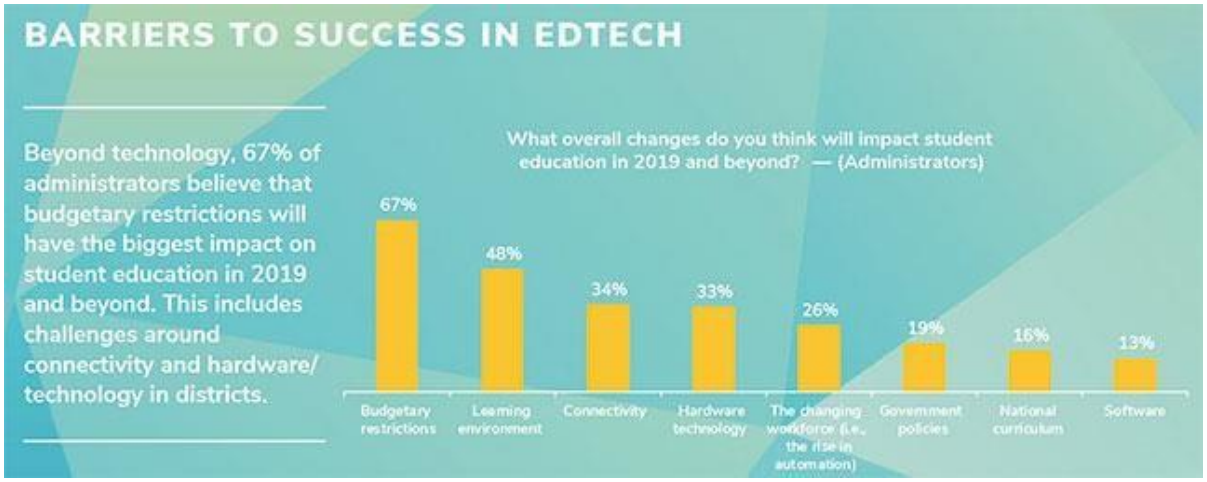


(Source: EdTech Review)

Supporting Industries:

b) Offline Education Industry: While a part of the offline education industry competes with the EdTech industry, there is a large part which has chosen to embrace EdTech either in collaboration with EdTech companies or via their own EdTech platforms. One key example of this in India is the Distance Learning programs offered by NMIMS University, Mumbai via their own NMIMS Portal program. Other initiatives include Coursera collaborating with Indian universities to allow them to sponsor Coursera courses for their students using the "Coursera For Universities" program. Coursera, EdX and other EdTech companies have also facilitated international courses in India, with their tie ups with international universities such as Harvard University, North Western University, and thousands more. COVID-19 has particularly accelerated the collaborations between the offline education industry and EdTech. This has primarily happened because the lack of movement has made offline learning solutions null and void for the foreseeable future. Around 61% of parents have subscribed their children to e-learning solutions during the lockdown in India, further justifying the shift as a result of the added demand [Source: Marilyn Maze Survey across 14 States and 38564parents]

c) Hardware Industry: The hardware industry, while not involved in the direct development of EdTech, largely impacts the EdTech Industry. EdTech is essentially part of the IT and Software Industry which delivers its products through hardware. Thecost and advancement of hardware has a major impact (33% as per the survey) on the delivery of E-learning solutions. When more people have access to quality hardware, the E-learning solutions can be provided to them easily and with a whole lot of features.E.g.: When the idea for MS Teams first came up, Microsoft had trouble propagating itbecause it is a higher bandwidth platform and occupies higher memory which was notsupported by many mobile, tablet, and laptop chipsets. Now, the new chipsets and RAM management systems allow MS Teams to work adequately on almost every device. Furthermore, we can also see in the survey results attached below that the main issue isbudgetary restrictions which reduce growth of EdTech, contributing to 67% of the concern. Average cost of smartphones has risen by 14.5% in 2019 and this could be detrimental for EdTech. [Source: Money Control]



Source: The Journal

IT Industry: The development of IT has a major impact on EdTech. Services like Cloud Computing, Operating Systems and Content Delivery Networks have a major impact on EdTech services. These can be divided into two parts, front end customer side and backend business side. The customer side involves operating systems such as Android, IOS, and Windows and also the user interface of the e-learning service. These have a major impact on the user experience and if they are not adequate, it would be detrimental for EdTech. Accordingto a Microsoft study in Time magazine, humans have an attention span of only 8 seconds. Thismeans users can focus on your website/app for only 8 seconds. After that, they either stay or leave. Now, the users' decision to explore or leave depends entirely on the UI/UX of your website or mobile app. If these users like the UI/UX and get the information they are looking for, they will stay for a couple of minutes or sometimes hours. That's why your business should emphasize offering useful information along with interactive user experience. The other side is the backend business side of things where cloud computing and content delivery networks come into play, these services need to be adequate in order to service media to the end consumerin an adequate manner. Services like Google CDN, MS Azure and Amazon S3, along with theirparent GCP, Azure and AWS platforms allow EdTech platforms like BYJU'S, Coursera, EdXand more to deliver their content in a seamless and lossless manner to the end customer. The cost of these services also has a major impact. A study by The Wire showed that Google and Amazon slashed their cloud computing prices by nearly 25% in late 2017 and the relatively reasonable cost has allowed EdTech platforms to scale. This price slash has directly correlatedwith the EdTech boom in the country.

d) Telecom Industry: Telecom companies majorly contribute to the success and failure ofEdTech. EdTech services are primarily delivered via the internet and telecom companies have a great impact on the cost of internet data services. When internet datais abundantly available, people are more and more willing to use services that require higher internet bandwidth. Well-developed telecom infrastructure in India will allow remote access among the rural population as well. This would allow for more inclusivity in e-learning services. The next generation of cellular connection includes both speed and simultaneity improvements, meaning that more devices can connect at once while also enjoying better download and upload speeds. Increased speed will get students and faculty closer to a seamless experience when it comesto videoconferencing with remote peers and experts. It also means that class time can be dedicated to instruction instead of to waiting on slow downloads or dealing with other connectivity hiccups. According to a recent Harvard study, students "learned more when taking part in classrooms that employed so-called active-learning strategies," this would only be possible to achieve with significant data speeds, which telecom players like Reliance Jio have indicated that they are in the process of rolling out. This new infrastructure would increase data speeds tenfold, which would have a drastic positive impact on the EdTech experience.

Government

Government's Role as an Industry Catalyst

The government of India has played a key role in the development of the E- learning industry, especially in recent COVID-19 outbreak. In an attempt to ensure that there is nointerruption in imparting education, HRD Minister Ramesh Pokhriyal advised students tocarry on with their studies with the help of digital learning platforms.

A host of new policy reforms were undertaken by the government under New Education Policy (2020) which include:

(a) **Pilot Studies for online education:** Appropriate agencies (like NETF, IGNOU, NITs, etc.) were identified to conduct pilot studies to evaluate the benefits of integratingeducation with online learning while mitigating downsides such as gadget addiction of students, inconvenient format of E-learning content, etc. The final results of these pilot studies were decided to be communicated publicly to enable continuous improvement.

(b) **Digital Infrastructure**: Investment in the creation of open, interoperable, evolvable digital infrastructure for the education sector.

(c) **Online teaching platforms and tools**: Existing e-learning platforms like SWAYAM, DIKSHA, etc. to were extended to provide teachers with structured, rich and user-friendlytools for monitoring progress of learners.

(d) **Digital Repository of content**: Digital repository of content like creation of coursework, learning games and simulations, augmented reality and virtual reality was developed witha clear public system for rating by users. For fun-based learning, student-appropriate toolslike apps, gamification, etc. in different languages were decided to be used.

(e) **Addressing the digital divide:** Since a vast section of the population does not have accessto internet, hence, television and radio was used for telecasting and broadcasting of educational content. Educational programs were made available 24/7 in different languages to cater to the needs of a diverse set of students. A special focus was given to provide digital content in all Indian languages.

(f) **Virtual Labs**: Existing E-learning platforms like DIKSHA, SWAYAMPRABHA, etc. were leveraged for creating virtual labs so that all students have access to experiment based learning experiences and quality practical learning.

(g) **Training and incentives for teachers:** Teachers were to undergo training on how they can become quality online content creators by using online teaching tools and platforms. The teacher was required to facilitate active student engagement with content as well as with each other.

(h) **Online Examinations and Assessments:** Appropriate bodies like the National Assessment Centre, school boards, etc. were to design and implement relevant assessment frameworks along with incorporating standardised assessments, assessment analytics, relevant rubrics, etc. Students would undertake these assessments using new education technologies focusing on the skills of the 21st century.

(i) **Blended modes of learning:** Different effective models of blended learning were identified for appropriate replication for different subjects. Standards were laid down for content, technology and pedagogy for online learning by relevant authorities like NETF.

Some of the programmes initiated by the government to make E-learning resources available to students include:

1. **SWAYAM:** This is a program initiated by the Government of India (in partnership with NCERT, IGNOU, AITE etc.) to provide the best learning resources for students pursuingeducation from class 9-12 and aspirants of Under-graduate and Post-Graduate courses. Various courses can be accessed on the portal developed by Ministry of Human Resource Development, free of cost. Students can access study material like Video lectures, Reading material, Self-assessment tests, Doubt sessions and online discussions.
2. **SWAYAM Prabha**: SWAYAM Prabha is an initiative which aims to provide 32 High Quality Educational Channels through Direct to Home (DTH) across the entire country ona full-time basis. The course content is based on a curriculum covering diverse disciplines.The primary aim of this initiative is to make quality learning resources available to remoteareas where internet availability is a challenge.
3. **SHAGUN Online Junction:** SHAGUN is an online junction under which several e- learning platforms have been launched by the Department of School Education and all States and Union Territories. There are 3 e-learning platforms which come under the purview of SHAGUN:
    a. NREOE
    b. DIKSHA
    c. E-Pathshala

(i) NATIONAL REPOSITORY OF OPEN EDUCATIONAL RESOURCES (NROER) This platform provides a portal for students to get access to a wide range of e-libraries, e-books,e-courses along with a chance for participating in online educational events and theme-based education.

(ii) DIKSHA

DIKSHA is a portal launched by National Digital Infrastructure for Teachers to equip teachersfrom class 1-12 to the world of e-learning. This platform provides learning material to both teachers as well as students. It is a very unique app which requires students and teachers to scan the QR code available in a book in order to get access to the learning material which is prescribed.

(iii) E-PATHSHALA

Through this web-portal, students from class 1st to 12th will be able to access no less than 1886audios, 2000 videos, 696 e-books (e-Pubs) and 504 Flip Books. The digital repository has beenmade available by NCERT.

These initiatives undertaken by the government act as a catalyst for the industry by making it more competitive. The government has also set a target to double the enrolment in higher

education to 50% under the NEP 2020. The NEP 2020 aims to increase the Gross Enrolment Ratio from 40 million to 92 million in FY35.

REGULATION AND COMPLIANCE

Currently E-learning companies in India have to deal with a web of regulations instead of a single focal government body since there is no official law to govern the sector. Both the Centre and the State can legislate on E-learning as Education is a part of the Concurrent list inthe Constitution of India. However, a comprehensive law for the sector is yet to be written. The ministry of HRD did announce plans to release guidelines for the E-learning industry earlier in the year but they haven't been released yet. The lack of a central regulator for all aspects governing the education sector and a lack of coordination between the centre and the state as well as different boards and institutes remain as major stumbling blocks, which warranta sharper attention and focus from the economic and regulatory perspective.

Chance

One major chance factor that has affected the E-learning industry in India is that of COVID-19. The onset of the COVID-19 Pandemic has seen a major rise in the demand for E-learning platforms. Previously considered as a secondary option and a supplement to traditional methodsof learning, E-learning is fast becoming an essential service in India ever since the lockdown has been enforced. Because of this, numerous platforms have been launched, re-advertised, upgraded and made more accessible to consumers due to the growing demand for online education. The growth rate of the Online Education market in India as of 2020 is 19.6%. The market is expected to grow at a compounded annual growth rate (CAGR) of 21% with the incremental growth anticipated to be USD 14.33 billion.

Listed below are some of the factors that have led to the progress of E-learning industry duringthis pandemic:

Increased Investments

EdTech start-ups have seen a record jump in fundraising as investors have started hunting for firms that are expected to benefit from the pandemic-driven e-learning boom. By the first halfof 2020, education-focused start-ups raised twice the amount of funds as compared to those raised in 2019. Venture capital firms have made investments of about $795 million incompanies like Byju's, Unacademy, Vedantu and many others.

Increased Consumption

From online lectures to live doubt-clearing sessions, mobile applications, e-books and other learning tools, the EdTech services sector is finding more and more customers and expandingrapidly. The economic uncertainty brought about by the pandemic has increased the need for continuous learning among people. Several skills have become redundant and there is **unemployment** on the rise. Hence in order to bridge the skill gap, a new urgency for**continuous up skilling** has been created in the Indian consumer market. Due to this, the EdTech industry has witnessed a **Bandwagon effect** wherein people have started availing online courses from companies like Coursera, Udemy, etc. at an unprecedented rate due to excess time on their hands owing to the pandemic. This has become a fad and according to anarticle by Times of India,

online courses have seen a 3X surge in demand amid the lockdown.Courses such as Business Analytics, Data science, Deep Learning, Machine Learning, HR Management, Digital Marketing, etc. have gained significant traction as people try and utilisetheir time as productively as possible.

Scope for Blended Learning

The E-learning industry has acquired some permanent users for the future through blended learning. In a blended form, learners seek education on a voluntary and collaborative basis. Education is not to be instructed, but to be explored organically. These values might be presenttoday purely by exception; however the post Covid learners in the public education system canbe of a different breed altogether, fuelled by digital expectations. This might lead to significantgrowth in the Education industry's B2B market.

Conclusion

1. **Strong Factor Conditions:** The presence of advanced factors such as Capital Resources, Human Resources, Technology and Innovation are propelling the growth ofthe Indian EdTech Industry at an unprecedented rate. Seeing significant trends in the investments of VC's into Edu-Tech start-up's such as BYJU's, the future of this industry seems to only get brighter. The infrastructure, although still inadequate in someareas, is rapidly changing due to the advent of "Jio-Fication" which is aimed at betteringthe digital landscape in India, therefore letting Edu-Tech players to further penetrate the market. Finally, technological advancements such as AR/VR in the Edu-Tech sector have opened the doors wide for these players to cater to the ever-changing needs of their tech-hungry target audience. Hence, we can say that the factor conditions are making the Edu-Tech industry highly competitive in India which can only lead to the furtherance of this sector in terms of growth potential.

2. **High and Sophisticated Home Demand:** The Indian demand for the Educational Technology Industry has grown leans and bounds. The young population backed with the constant need of upskilling is going to be the biggest sector under this Industry. The internet penetration and access to smart phones are increasing year on year and soon all Indians will access. The industry is going to see positive trends like multi - channel usage, customisation and artificial intelligence.

3. **Intense Domestic Competition and Product Innovation:** As the Indian EdTech Market grows and become more competitive, **with a concentration ratio of 40%,** thefirms are racing to become market leaders and establish a foothold in the industry. Thestrategy, structure and rivalry of the Indian EdTech firms is evolving with firms continuously investing in R & D to drive product innovation and world- class EducationTechnology.

4. **Strong Supporting Industries:** The telecom sector will be a major driver with the upcoming 5G Spectrum auctions. More and more educational institutes are expected to adapt to EdTech

requirements. Hardware manufacturers have also realised the requirements of EdTech and have started optimising their devices for the same. The ITindustry at large has been applying the same CDN principles that were seen in the OTTplatform industry to EdTech. This is just the beginning of what could be something ofa revolutionary order to educate the masses.

5. **Supporting Role of Government:** The government is playing the major role of a supporter and facilitator of the E-learning industry in India. Necessary steps have beentaken to boost the industry and ensure that all students in the country have access to quality education. While the sector is growing significantly and India is currently hometo the second highest number of EdTech companies, there is still a lot of room to improve. Factors such as tangled regulations governing the education sector in India, lack of uniformity in government policies, lack of financial incentives for research andinnovation in EdTech space, patchy internet connectivity especially in the rural areas and other socio-economic barriers are some impediments to the growth of this sector in India.

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