



DIGITALISATION OF HIGHER EDUCATION

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ABSTRACT

The digitalisation wave has swept every aspect of the society be it daily chores, to shopping, to travel to manufacturing to retailing to advancements in medicine and so on. How can education be untouched by the transformations that the digitalisation is bringing to this sector.

Technological impact on Indian higher education is expected to increase. Higher Education sector is already experimenting with the technological solutions like Digital Marketing, Chatbots, Lead management, Artificial Intelligence/Machine Learning, Augmented Reality/Virtual Reality, Cloud computing & Blockchain Technology. There are various EDUTECHs that are working in the areas like admissions, counselling, online learning, placements, alumni associations, operations, assessments.

This paper attempts to evaluate the digitalisation scenario in higher education, key technologies & its drivers & will identify the EDUTECH solutions that will help in accelerating the digitalisation in higher education.

Key words: higher education; admissions; online education; university education; digital strategy; India; Asia; digitalisation, EDUTECH.

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1. INTRODUCTION

1.1. Evolution of Education Technology Ecosystem & EDUTECH

Digitalisation is a very well-known concept in the industry parlance, and as we have moved it has evolved its own progressions like Digital 2.0, Digital 4.0 etc. With the advent of COVID-19 the digitalisation has got a fillip and it has accelerated even further. It is said that what CTO's & CEO's could not achieve in last 10 years in the area of digital transformation, COVID-19 has created that transformation in just a few months.

The digitalisation in the education sector began with the invention of internet itself also known as world wide web. It resulted in the connection of the universities, institutions of eminence, students, libraries and enabled communication and exchange of educational information among students, faculties & research scholars leading to a greater degree of collaborations & faster exchange of educational & research content. It also enabled easier

publication & circulation of the educational & research content. In the present paper we will go beyond the initial progresses in terms of digitalisation which can be termed as Educational Technology 1.0 or EDUTECH 1.0. We will explore the 4 stages of evolution of EDUTECH and also delve into the future & define what EDUTECH 5.0 will bring into foray for the educationists & learners.

- EDUTECH 1.0 – Advent of personal computers used for the administration and management of work at universities.
- EDUTECH 2.0 – The era of the beginning of world wide web & internet protocols to connect universities & research institutions.
- EDUTECH 3.0 – Use of ERP tools to streamline the admiration and management of the process at the higher education Institutions.
- EDUTECH 4.0 – Automation of learning processes using LMS, Emergence of Online courses aggregators, use of smart classes, Learning Apps.
- EDUTECH 5.0 – Post COVID era integrating the power of Mobile, 5G internet connectivity, Cloud Technology, AI/ML, VR, AR, Block chain, IOT & wider acceptance online learning platforms.

2. OBJECTIVE & METHODOLOGY

Objective of this research paper is to analyse impact EDUTECH's are making on the higher education ecosystem. The paper intends to highlight the elements of research that support the explosive penetration of EDUTECH solutions and the top EDUTECH tools for Indian Higher Education sector can use for digitalisation. This paper intends to identify the possibilities of emerging education technologies such as Artificial Intelligence, Machine Learning, Virtual Reality, Augmented Reality, Blockchain, Chatbots, ERP, CRM, Cloud Technology while also identifying key EDUTECH solution providers for higher education working on these technologies.

- Analyse the Indian higher education sector & EDUTECH scenario
- Analyse the key growth drivers of EDUTECH
- Identification of key EDUTECHs working in the education technology domains which counselling, admissions, placements, alumni associations, online learning, operations, assessments etc.
- What benefits can higher education institution adopt to successfully spearhead the digitalisation & digital transformation with the help of EDUTECH ecosystem.

3. INDIAN HIGHER EDUCATION & EDUTECH SCENARIO

The higher education sector has enrolled more than 12 million students for the 2018- 2019 session. More than 35 million students are estimated to be enrolled in higher education in India in 2020.

Few statistics to establish the importance & the significance of the topic is evident form the growth potential of higher education & EDUTECHs in India. Indian higher education industry is currently \$19 billion. It is estimated to be \$35 billion by 2025. In comparison the global EDUTECH market is estimated to be \$611 billion by 2025. The EDUTECH market, in ASIA is expected to be 24% of the global EDUTECH market. The Indian EDUTECH market potential is expected to reach \$31 billion by 2025. The FDI in Indian education sector is estimated to be USD 5.8 billion by 2025 from USD 2.1 billion in 2018 (IBEF Report).

The online presence of universities and institutions for higher education is growing considerably. Online education in India will be a \$2 billion industry by 2021 (KPMG, 2018).

In the Union Budget 2020-21 the Digital India Initiative is allocated a significant increased funding of 23%, it clearly shows the focus of the government towards the digitalisation.

3.1. The key Driver which are Fuelling Growth of EDUTECH for Digitalisation in Higher Education

India is fast emerging as a hot spot for the EDUTECH revolution. The demographic dividend of India presents both an opportunity in terms of demand & the challenge to improve the productivity & effectiveness. To provide opportunities for the large population growth in India there is a need to vastly improve productivity, and technology adoption in higher education sector is the only route to enhancing productivity & effectiveness. Since the demand for the higher education seats with outstrip the capacity, hence the only through an in-campus it will not be possible to satisfy the demands and needs of the students in higher education. Higher education will have to evolve and move towards an online & blended learning approach. Various initiatives by the government of India & states are helping in not only building the awareness but also creating the necessary infrastructure to support the digitalisation initiatives in education sector. For example in her paper Dr. Lila Simon in 2015 as described, how Madhya Pradesh is in the forefront when it comes to taking e-governance to the masses. Madhya Pradesh has experienced Gyandoot project and won acclaim universal by initiating right steps for bridging the digital divide with the imminent government initiatives in the field of Information Technology. Bhopal is totally geared up with acceptance of many MNC's making their hubs (Simon, Lila, Oct, 2015).

Tremendous growth in both subscribers, mobile technologies & cloud computing in India has placed it at a position of advantage to fast track the EDUTECH revolution. India has progressed to mobile phones directly and even that is glaring at the advent of 5G combined with the power of cloud computing & virtualisation. Smartphone's penetration in India, will catalyse EDUTECH reach & adoption. India has close to 850 million mobile users which is further increasing by around 10 million per month. The mobile devices are already becoming the classrooms of tomorrow. There is a clear recognition of the potential for mobile learning which is expected grow the Indian mobile education market.

In India, the parents & students understand it very well that the path to prosperity & economic independence is primarily through higher education. India has a culture which is very positive towards the power of education and that translates into a positive attitude towards the technology-led education platforms & apps that people wish to adopt. Dr. Lila Simon in her research has clearly established that the digital awareness is playing a key role in the adoption and satisfaction with the digitalisation initiatives. The level of satisfaction among the citizens of the city with growth in the IT sector will go high provided they are aware about the same. The digitalization of Madhya Pradesh is growing steeply and as a citizen of the State, one should always have the awareness on the growth of their own State (Simon, Lila, March, 2015).

Key drivers of growth for EDUTECH are

- Young aspiring learners
- Rise in EDUTECH start-ups
- Increased spending in educational infrastructure
- Education virtualisation with smartphone & data
- Government initiatives & policies
- FDI in education & EDUTECH

3.2. Discussion on how digitalisation & EDUTECHs are Transforming key functions in Higher Education

Digitalisation uses technology to dramatically improve & simplify processes, activities, services, products and experiences. Digitalisation is an important tool for higher education. This research paper presents the importance impact of digitalisation for higher education how it can play a significant role in various functions, right from admissions, teaching, learning & management of various process.

Key functions in the higher education system that can benefit from digital transformation

- Counselling
- Admissions
- Education
- Assessment
- Skill Training
- Research
- Placements
- Alumni Association
- Administration

4. ANALYSIS OF EDUTECHS

Higher Education institutes and universities will quickly adopt the education technologies not only to improve the productivity& effectiveness of learning outcomes but also add the value to their students.

Below table will help in understanding the EDUTECH tools that are working to transform the Higher Education, they can leverage & transform the processes with the help of new technologies in creating a new vision for the higher education.

Table 1 Analysis of EDUTECH solutions available to digitalise the key functions of higher education:

Sno	Admissions	Administration	Learning Management System	Placements	Alumni	Multi Domain Tools
1	NO PAPER FORMS	Academia ERP	Alpha Learn	Reculta	VAAVE	JUNO
2	Leadsquared	Ruby Campus	Vclass Rooming	Superset	Almahub	mUNI
3	Extra Edge	Campus365	Ipix	Birdingo	Almashine	Deskera
4	ORAI	ZOHO	Endnote	Ubitech Solution	Akmaconnect	Mastersoft
5	Forms dot star	SAGOUS	EDUTECH	Talent Recruit	Univibe	OpenEduCat
6	ePravesh	Creatrix	Mettl Mercer		Almabase	My Class campus
7		IFW CAMPUS	Blackboard			Edusys
8		ellucian	Eduswitch			TCS ION
9		Panasonic	Eklavya Admitech			Microsoft

4.1. Understanding the benefits derived by higher education institution adopting digitalisation & digital transformation with the help of EDUTECH ecosystem

The use of new technology in higher education is globally recognised as both a necessity and an opportunity. Education Technology is bringing transformation in higher education and delivering benefits in many ways:

Automation: India is in top 2 in terms of student admissions in higher education. Higher education institutes & universities will cross 45000 mark by 2025. With such a scale the biggest need of the higher education industry is automation and EDUTECH is well poised to easily bring about that change in various functions especially the admissions process. There are clear benefits in terms of lead nurturing, lead tracking & online admissions process.

Artificial Intelligence & Machine Learning (AI/ML): AI/ML can play a big role in higher education institutions it can be used for AI teaching assistants to improve the performance of students & even curriculum design.

Big Data & Analytics: Big Data & analytics in higher education helps in tracking the performance and progress students to improve the learning process.

Chatbots: Chatbots can answer the simple, mundane & repetitive questions of the students & free the administrative & faculty time for more productive learning initiatives. At the same time, it will benefit the students by saving their time and reducing their concerns and stress. An additional benefit of the chatbot is that, it helps in ADA compliance.

Augment Reality (AR) and Virtual reality (VR): Two technologies that are gathering momentum for application in the education sector are AR & VR. These can help create a learning environment that is far richer & will generate immense interest from the students in the learning process. There are possibilities to gamify the learning concepts.

Technology for special needs: Our higher education system is not necessarily tailored for students with special needs. However, EDUTECH can help in enabling learning for students with special needs in a structured manner to deal with the needs of students with visual, hearing, language and comprehension or even students learning disabilities. EDUTECH platforms can be a great boon for people who cannot adapt to the requirements of a traditional setup of higher education system.

Internet of Things: Higher education institutions have many smart devices in the campus in the form of smartphones, smart-watches, e-bike, cars, smart classroom & Apps. Government is talking about smart cities but can we have a smart university campus? IoT can make the university campuses in future can look like mini smart cities with smart lighting, student tracking, access controls, informational kiosks, vehicle tracking etc.

Blockchain Technology: The blockchain technology helps in storing and transmitting the information in a secure, distributed & effective manner. Educational facilities may use blockchain technology to store student data & learning performance. Another benefit of such technology is high level of data security, authenticity & reliability. The mark-sheets & degrees can be verified using the blockchain technology to avoid the need for re-verifications by the employers for authenticity check & prevent cheating.

5. CONCLUSION

The EDUTECH solutions and ideas described in this report aim to ensure that the higher education institutions and universities can adopt these technologies for student success and also enhance the learning outcomes many folds. At the same time the higher education institutions shall benefit greatly in terms of productivity, efficiency & creating an image of a progressive institution of learning. These EDUTECH solutions should benefit the learners, educators & administrators in their pursuit of knowledge and skills.

Immense cost advantages and improvement of quality parameters with respect to academics will ensue with the introduction of advanced automation & self-service options led by education technologies and solutions described. These EDUTECH solutions should be developed on modern, secure and dependable IT platforms, to ensure better outcomes and scalability to enable future growth.

The financial implications and the resources requirements to implement EDUTECH solutions might be on the higher side sometimes but the resultant productivity enhancements & effectiveness is worth the effort. With the scale of the EDUTECH implementations going up the cost will definitely come down drastically in days to come.

Managing the digital transformation of a higher education institution requires a vision as well as persistence to see the benefits & improvements. By implementing the improved technology enabled business process and EDUTECH solutions the higher education institutions will gain immense reductions in costs and improved efficiency.

We are witnessing that leadership of higher education intuitions are embracing the new and innovative use of education technology and it is definitely going to build the base of the future technologies that will transform the learning process as we know it today. The learning process is bound to become online, real time, experiential, augmented & evolve into a learning economy.

WAY AHEAD

Digitalisation in higher education is a very broad topic, however based on the literature review in both international & national journal very limited aspects of the role of digitalisation in transforming the admissions processes & its effects on the student's success, career/specialisation choice & learning methodologies. This paper addresses issues involved in digitalisation of higher education and brings about the expected challenges and opportunities in higher education. In the next paper digitalisation in admissions & learning process will be researched in greater depth and its effects on choice of specialisation/field of study & learning outcomes. The quantitative analysis of the impact on various functions & quantitative analysis of the EDUTECH solutions will also be part of the next paper.

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