



# A COMPARATIVE ANALYSIS OF DIGITAL TRANSFORMATION IN GLOBAL HIGHER EDUCATION

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## ABSTRACT

*COVID-19 pandemic has boosted the journey of Digital transformation in education sector globally. Although the importance of digitization in education sector and more so in higher education was never denied, Indian education system always focused on traditional ways of teaching-learning rather than digital methods. This has led to Indian higher education system lagging behind with respect to the international standards. Across the globe, education industries are competing to bring the international standards to meet the growing demands of students. Hence, it is necessary to carry out comparative analysis of digital transformation in Indian higher education with other countries like China, Indonesia, Brazil and United states of America. Further, the study also attempts to assess the digital readiness of the Indian higher education system.*

**Keywords:** *Digital transformation, Higher education, Global comparison, Online learning, Digital readiness*

## INTRODUCTION

The online teaching in India has got a long history with first one-way video and two-ways audio teleconferencing facility provided by ISROU at IGNOU, New Delhi in 1994. This set a base platform for a large number of online courses such as management studies, computer science and especially for teachers training in India.<sup>1</sup> In 2005 an effort was made by ISROU in collaboration with MHRD and IGNOU to fulfill the two-ways communication need with the launch of EDUSAT satellite designed by Dr. APJ Abdul Kalam during his tenure as President of India. By 2007, India embraced Open Education Resources (OER), with the support from government and external funding agencies. With OER movement India initiated distance education to reduce spatial, geographical, economic, and demographic boundaries to provide easy access to higher education bridging the gap between non-formal, informal and formal learning. The "Digital First" approach of the government to

facilitate the entire gamut of educational activities has provided multifarious education eco-system architecture for expansion of digital infrastructure making it future-ready. Government is also expected to increase the annual budget of education from the present 2.9 percent to 6 percent of GDP (as per NEP 2020), to create an ecosystem for research and development in the education sector. Although Government of India is taking several initiatives to promote digital transformation in Indian higher education sector, it is imperative to study the state of art technologies that world is adopting. This will not only ensure correct and up-front selection of technology but also enable Indian students to emerge as global leaders.

## COMPARISON OF INDIAN SITUATION WITH OTHER COUNTRIES

China, Brazil and Indonesia are some countries that are culturally similar to India. Therefore, these countries are identified for further study along with the final comparison with United States of America that is way ahead of these countries.

### CHINA

Like India, many Chinese education companies implement a mixed approach of online and offline education. According to Deloitte<sup>2</sup>, *the so-called 'double teacher method' was most popular in 2017, involving an online teacher addressing students via video broadcast as well as a teaching assistant instructing them in person.* China's digital education market has experienced substantial growth in the past and has a potential to become more important in the future. A glance at some figures illustrates how successful the Chinese digital education market has been even before the pandemic. According to the consultancy firm iResearch the market had reached USD 36 billion \$ by the end of 2018, having experienced a consistent year-on-year growth of about 25% since 2012. Factually, the Chinese digital education market has more than tripled in just seven years. A report by the China Internet Network Information Center states that the number of users reached USD 232 million by June 2019. It is also revealed by the fact that eight out of the world's fifteen largest digital education companies are based in China viz. VIPKid, Liulishuo and New Oriental. The Chinese consulting company iResearch predicts an annual growth of 16% to 25%. This would translate to a doubling of the current market volume in three to five years, putting it at USD \$ 77 billion. Meanwhile the Chinese online population is predicted to go up as well. Moreover, China has shown a willingness to accept and adopt to the growth. According to the Minister of Education, China will continue to invest in artificial intelligence to improve education.

### BRAZIL

Brazil is facing similar problems that other countries are facing like the preparation of teachers in the use of ICT, *supplying schools with high-speed and up-to-date hardware and software, encouraging teachers to use ICT, etc.* (Arteaga et al., 2020)<sup>3</sup>. Although Brazil has the resources to develop new products in the area of technology, which respects Brazilian culture, such as the local language, there is a tendency to seek out the results of research and solutions in other countries, like India. Despite the development of technological skills, Brazilian educators

are not yet prepared to support a digital culture in schools. This denotes the need for initial teacher training in digital literacy. Another problem is the poorly distributed infrastructure in the country. (Ziamba, 2019)<sup>4</sup>. Some Brazilian private schools, use technological resources, support classroom learning in different subjects such as Mathematics, Portuguese or Foreign Language. However, in most public schools, ICT use extends only as far as PowerPoint, text editors, and spreadsheets are concerned. Another problem is the high number of hours that teachers spend working in the classroom. Many of them, to supplement their income, have three work shifts, that makes continuous training in the use of ICTs particularly difficult. *Despite policies for digital inclusion in academic curricula and programs for teacher training (such as the National Educational Technology Program - ProInfo), preparing teachers to use technologies in teaching and learning is not considered a priority* (Tomczyk & Oyelere, 2019)<sup>5</sup>. *When used well, ICTs offer an opportunity to create job opportunities and inclusive solutions* (Stosic, 2017)<sup>6</sup>. Although the institutions have the role of preparing future business employees, private Brazilian companies do not invest in technological resources in Education.

## INDONESIA

Indonesia has indeed shown its seriousness and understanding of the need for digital transformation. In 2012, the government of Indonesia conducted the initial stage program by transforming 36 study programs into 19 different distance education program institutions (B.R. Aditya et al.2021)<sup>7</sup>. However, the initiation of digital transformation in higher education institutions in Indonesia has not been effective yet, and data in 2019 showed that 11 of the 36 distance education study programs failed to implement the Digital transformation [Ristekdikti(2019b)]<sup>8</sup>.

B.R. Aditya et al. 2021<sup>9</sup> revealed that *the failure in translating strategy into a concrete plan of action occurred due to number of factors such as lack of human resources in digital transformation, lack of a shared vision, lack of institutional policy, lack of strategic planning, reluctance to leave comfort zone, etc. are the major barriers in implementing digital transformation in Indonesian higher education*. Therefore, higher education institutions in Indonesia must have a good foundation of readiness to achieve successful implementation of the (DT) Digital Transformation.

Like India, with the outbreak of Covid-19 pandemic, 98 % of Indonesian universities undertook online education based on a survey of the Directorate-General of Higher Education. This achievement is remarkable since only a few universities had learned online training before the pandemic (Fikri & Diana, 2020)<sup>10</sup>. Social media platforms and conferencing applications are more popular than EdTech for digital learning. Facebook, WhatsApp, and LINE; and conferencing applications Google-meet and Zoom are the most popular choices for communication and sharing teaching assignments. They are easier to use, affordable and do not require high Internet speed. There is limited uptake of online education platforms by students and teachers due to lack of awareness and perceptions of low quality. *The shift of education outside the classroom has led to challenges for monitoring teaching and learning performances* (UNICEF 2020)<sup>11</sup>. On the other hand, lecturers and students have also tried to adapt to

online learning. Some higher education institutions have provided guidance for lecturers and students. However, *higher education in Indonesia still needs to be done more carefully through hybrid learning* (Nursjanti F. et.al 2021)<sup>12</sup>.

## UNITED STATES OF AMERICA

*The digital era in the US education system began in the 1980s with the setting up of computer labs, and the increasing urge to make future-ready students* (Anderson & Ronnkvist, 1999)<sup>13</sup>. With the advent of the 21st Century, the US education system witnessed pressure for the active involvement of the students as creators of knowledge, using apt technologies. *The Department of Education released the revised 'National Education Technology Plan (NETP)' 2017 with a focus on integrating technology to transform learning experiences for providing greater equity and accessibility* (OET, 2017)<sup>14</sup>; teachers were central to this transformation plan. The review of the secondary literature reveals that the evolution of educational technology viz-a-viz pedagogic transformation within the US education system is well-researched and documented. *The journey of the US education pedagogic transformation provides evidence that this developed nation has policies informed by the knowledge* (Spiel, et al., 2019)<sup>15</sup>.

However, higher education sector is found significantly lagged behind other industries to a more digitally-driven, outcomes-focused business model. One measure of this is that less than 5% of college budgets are dedicated to IT spending. Following a slow, two-decade march toward more digital business models, higher education's overdue technological transformation has been rapidly accelerated by 2020, and centers more than ever on technology- and analytics-driven online learning experiences and business models. *The number of students exclusively taking face-to-face classes on the campus has been dropping* (Seaman, Allen, & Seaman, 2018)<sup>16</sup>. *In 2016, there were over 6 million students in the U.S. who enrolled in at least one online course* (Lederman, 2018)<sup>17</sup>, and the proportion of students enrolled in at least one online course has risen to over 30%. However, it is surprising to note that out of the total enrollments only 1% of the students actually took the online classes. This implies that the majority of online programs are not currently attracting students who live far from the university that presents both an opportunity and a challenge to universities.

However, educational institutions also face a variety of institutional-, instructor and student related impediments to successful implementation, maintenance, and growth of online programs. *There has been a steady decline in college enrollment in the U.S., from 20.6 million in 2011 to 19 million in 2016* (Hildreth, 2017)<sup>18</sup>. Reasons for declining college enrollments include a number of factors such as cost of college education, fear for the incremental value of higher education, increasing cost of commuting, minority, foreign culture, or interests.

*Besides the challenge of declining enrollments, institutional factors such as lack of understanding of online pedagogy and online learning styles, lack of administrative support for online education and for marketing the program, number of students enrolled, faculty qualifications, tuition rates, and length of the program* (Kentnor, 2015)<sup>19</sup> can further doom the program to failure. In addition, Popovich and Neel (2005)<sup>20</sup> investigated a variety

of institutional characteristics that relate to online courses and programs at AACSB-accredited business schools. They noted disadvantages such as potentially reduced quality of education, increased faculty training costs, faculty resistance, financial aid constraints, program startup costs and challenges and potential infringement on existing programs.

Due to Covid 19 pandemic, online learning became the default in 2020, which is simple “remote learning” via live Zoom classes, a method evolved from video conferencing from the late-1990s. However, in the multi-billion-dollar market for fully online courses and degrees, a variety of powerful new platforms and technologies have emerged. MOOC platforms such as Coursera and EdX leverage data using machine learning to automatically grade assignments and deliver adaptive content and assessments. Machine learning, SMS messaging, and AI are also very important. Like commercial businesses, many universities are beginning to deploy blended and fully AI-based chatbots to support students and help them navigate key admissions, enrollment, and course deadlines. The aggregation of multiple universities and their courses and programs into single distributed platforms is also opening up new business-to-business (B2B) channels through direct partnerships with employers. Online education providers like Straighter Line and Udemy are taking this trend even further, offering Netflix-like options for students to earn transferable college credits or other credentials for a monthly subscription. In the US, EdTech has grown in multiple directions – from LMS to distribution platforms such as e-learning apps, massive open online courses (MOOCs) and online certification.

## INDIA

According to the government projections, India’s EdTech expenditure could scale to US\$10 trillion by 2030. Also, India has become the second largest market for E-learning after the US. *According to KPMG India and Google, the major drivers for online/blended education in India include (a) phenomenal growth in Internet and smartphone penetration (b) low cost of online education (c) digital-friendly government policies; and (d) escalating demand by working professionals and job-seekers for continuing education (Bansal, 2017)<sup>21</sup>. India was about 20 years behind the developed nations in introducing technologies (ICT) in public institutions. Pre-pandemic, there was already widespread acknowledgment that the traditional higher education business model is seriously challenged.*

## DISCUSSION

Covid-19 has accelerated adoption of digital technologies to deliver education. It encouraged all teachers and students to become more technology savvy. Any of these stakeholders reporting of adopting a proactive stance towards design and digital technology; started to innovate and design better tools to meet the needs of digitalized basic education. This is something that should appear *if the remote education arrangements prevail; the world is definitely not perfect yet (N.liwari et al.2020)<sup>22</sup>. To successfully integrate ICT into the learning process, it is crucial to apply the systems thinking perspective to studying and understanding of the classroom and the university as a whole. (Diana Kozlova, Marcel Pikhart,2021)<sup>23</sup>.*

In support with latest trends like ERP tools, IoT, Artificial intelligence and ICT, Block chain implementation in higher education will act as a catalyst to upgrade the existing crippled education system. The upcoming years won't be the same for educational institutions as it was used to be. Therefore, it is very important for educational institutions to upgrade and prepare themselves for future. *Block-chain based digital certificates to maintain the integrity of the education process is yet another useful application* (Saxena A.et al.2020)<sup>24</sup>. Digital transformation in higher education, especially in the post-pandemic world, is seen as inevitable and digital maturity is considered as the key predictor of success. Robust infrastructure where both digital and physical platforms play equally important roles is the need of the hour in the new normal (PwC survey 2020).

## CONCLUSION

The digital transformation in U.S. higher education system is prospering with well-founded infrastructure and supportive policies. China is following digitization more aggressively and will be leading in it. While Brazil and Indonesia education system has limited digitization and they are trying to meet the expectations. In India, despite high political appreciation for technology and infrastructural development, the digital divide to access and availability of resources and content among government teachers and students exist. Several initiatives of Government of India and private partners are showing results.

Thus, it can be said that use of state-of-the-art technologies on various platforms of higher education is imperative now. To overcome the vulnerabilities suffered by economically poor communities due to social inequalities and digital divide there is need to amalgamate higher education strategies by developing sound model for partnership among different institutions or universities. Adequate planning and implementation of best practices and innovative strategies is necessary for a university to successfully introduce and/or expand online education to surpass the barriers faced by various stakeholders.

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