Recent Technological Trends in Higher Education sector in India

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***ABSTRACT***

Influence of technology has immensely increased on education and this paper attempts to identify the technological trends that are influencing higher education sector in India. Technology increasingly is being used to personalize learning and give students more choice over what and how they learn and at what pace, preparing them to organize and direct their own learning for the rest of their lives. Sophisticated software are being used to provide personalized learning. Use of technology in Indian classroom at least in private schools has increased in recent past. Technology has become essential in order to prepare students for challenges of future workplace which is constantly evolving due to fourth industrial revolution. Some of the recent or future trends in technology of education are: E-learning or cloud learning, Use of Analytics in Education, Developing Cultures of Entrepreneurship and Innovation, Collaborations and partnership between Educational Institutions, Analytics companies, Proliferation of Open Educational Resources/MOOCs, New Forms of Interdisciplinary Studies and redesigning learning Spaces. Educational institutions and academia will have to adapt to the changing scenario of education sector to stay in demand. The role of teacher is also going to become even more important and evolve from being an instructor to facilitator.

***Key Words: Higher Education, Big Data, Artificial intelligence, Massive online open courses (MOOCs)***

# I Introduction

Higher Education has always been important not only to individuals for the sake of enriched lives, greater earning capacity and higher status but also to the economy for the sake of economic prosperity. Skilled human resources have always been considered to be the biggest assets of a modern & progressive country. However, the relevance of skill development has never been greater than present time. In today’s Internet age, industrial battles are fought not only on scale of capital investment but on knowledge. With the advent of technology, new developments can be seen in education sector also. Big Data analytics is changing the way educational institutions are designing courses and learning experiences, vast advancements in Artificial intelligence has changed the need and requirement of industry in turn affecting the demand and course curriculum of courses. Thus, higher education, today face unprecedented challenges that educational institutions will have to address. Some challenges are solvable yet some challenges demand more attention from all stakeholders.

Regarding the major obstacles for higher education, authentic learning experiences and an advanced need to improve digital literacy are considered to be the solvable challenges—those that are already being addressed by programs at individual institutions. Challenges for which solutions remain difficult to scale include advancing digital equity and adapting traditional organizational models to more flexible designs that advance the future of the workplace. The experts identified political and economic pressures as those that create a wicked challenge—one that is difficult to define and even more challenging to solve. Similarly, rethinking the roles of educators is also considered a complex problem to define and solve. As educational technology is rapidly advancing and evolving, it is difficult to discern how to overcome these challenges to advance and scale technology adoption to increase student success, at least in the discernible future. (EDUCAUSE- Horizon report, 2018)

India also through its Digital India programme, aims to promote E-education. Digital India programme aims to connect all schools with broadband, provide free Wi-Fi in all secondary and higher secondary schools. It also aims to develop a programme on digital literacy at the national level and develop Massive Online Open Courses (MOOCs). In the light of all the changes and increasing influence of technology on education, this paper attempts to identify the technological trends that are influencing higher education sector in India

## II Review of Related Literature

Horizon report 2018 identifies what is on the five-year horizon for higher education institutions, which trends and technology developments will drive educational change, what are the critical challenges and how can we strategize solutions? These questions regarding technology adoption and educational change are discussed in this report. The report presented two long-term impact trends: advancing cultures of innovation and an increase in cross-institution collaboration.

Jha.N, Shenoy.V. (2016) in their paper ‘Digitization of Indian Education Process: A Hope or Hype’ analyzes the nature of the modern education process in India where diversity is seen not only in culture and ethnicity but also in purchasing power and affordability of the Indian people. The paper notes that to make online education successful in India we need to modify the entire education sector and the mind-set of the employers as it has not gained their favour yet. We are yet to travel miles before we reach the stage where we can proudly say certificates and degrees are just piece of papers for us we value knowledge of the person. The study proposes hybrid model to meet the requirements of Indian students where there should be a combination of physical presence of the teacher and technology.

Keswani. B, Banerjee.C, Patni.P. (2014) in their paper ‘Role of Technology in Education: A 21st Century Approach’ outlines how information technology can help to create an education system that is based on the principles of helping teachers, students and administration to be effective in what they do, improving the quality and relevance of teaching learning process. According to the paper, some benefits of using information technology in education: It induces scientific, economic, technological, information and multicultural literacy and global awareness, promotes inventive thinking and develops effective communication which leads to teaming, collaboration and interpersonal skills.

Nisha.F, Senthil.V. (2015) in their paper ‘MOOCs: Changing Trend Towards Open Distance Learning with Special Reference to India’ provides an overview about massive open online courses (MOOCs), about how technology has changed over the years the face of distance learning and how relevant and beneficial these courses might be for distance learners. Studies related to MOOCs in India and world around have been reviewed. The paper concludes that MOOCs and online education has a huge potential which would help in accelerating and ensuring social cohesion and sustainable growth. With little efforts by the Government of India, online education can successfully reach every individual.

**Daniel, Ben (2014)** in their paper ‘**Big Data and analytics in Higher Education: Opportunities and challenges’** identifies contemporary challenges facing institutions of higher education worldwide and explores the potential of Big Data in addressing these challenges. The paper then outlines a number of opportunities and challenges associated with the implementation of Big Data in the context of higher education. The paper concludes by outlining future directions relating to the development and implementation of an institutional project on Big Data.

## III Analysis and discussions

Technology increasingly is being used to personalize learning and give students more choice over what and how they learn and at what pace, preparing them to organize and direct their own learning for the rest of their lives. Sophisticated software has begun to allow us to adapt assessments and instruction to the needs and abilities of individual learners and provide near real-time results. Nationally, significant progress has been made toward ensuring that every school has high-speed classroom connectivity as a foundation for other learning innovations. The cost of digital devices has decreased dramatically, while computing power has increased, along with the availability of high-quality interactive educational tools and apps. Technology has allowed us to rethink the design of physical learning spaces to accommodate new and expanded relationships among learners, teachers, peers, and mentors. (Office of Education Technology US, 2017) Some of the recent or future trends are discussed as follows:

1. **E-learning or cloud learning:**

Use of technology in Indian classroom at least in private schools has increased in recent past. Technology has become essential in order to prepare students for challenges of future workplace. Companies like Educomp are offering smart classes in the space of digital content usage in the classroom. Such digital classrooms provide classroom technology taking advantage of a large repository of digital content across all subjects from kindergarten to grade 12. Another trend that will grow further in coming years is cloud learning. Ministry of Electronics and Information technology (MeitY) has identified E-Learning as one of the thrust area for imparting education using educational tools and communication media. It is the learning facilitated and supported by Information Communication technologies (ICT). The broad objective is to develop tools and technologies to promote E-Learning. (MeitY) has been financially supporting R&D projects in the area of E-Learning at various academic educational institutes, R&D Labs etc. and providing grant-in-aid for R&D projects in the area of content development, R&D / Technology development projects, Human Resource Development projects & Faculty Training to improve literacy through distance education using Information and Communication Technology (ICT) Tools (Computers, Multimedia and the Web). (MeitY, 2018)

Presently, a number of our schools suffer from a low quality education delivery, primarily due to short-handed staff, inefficient infrastructure, tiny classrooms and lack of teachers. Cloud computing solutions can solve many of these problems through online lesson planning tools, automating school management process, and online homework submission etc. Cloud technology will eventually ensure that the present factory model of education disappears from the systems. This assurance comes from the fact that cloud solutions do not require any traditional education tools like classrooms, teachers, textbooks etc. (Jha.N, Shenoy.V. 2016)

1. **Use of Analytics in Education**

Educational Institutions are using Learning Analytics and Academic Analytics to improve students learning experience and manage their resources in a more efficient way. In future, use of analytics in education is going to improve even further. Learning analytics can facilitate evaluation of the effectiveness of pedagogies and instructional designs for improvement, and help to monitor closely students’ learning and persistence, predict students’ performance, detect undesirable learning behaviours and emotional states, and identify students at risk, for taking prompt follow-up action and providing proper assistance to students. **(**Billy Tak Ming Wong, 2017). Academic analytics is the application of business intelligence (BI) tools and strategies to guide decision-making practices in educational institutions. The goal of an academic analytics program is to help those charged with strategic planning in a learning environment to measure, collect, decipher, report and share data in an effective manner so that operational, program and student strengths and weaknesses can be identified. (Tech Target)

1. **Developing Cultures of Entrepreneurship and Innovation:**

The fourth industrial revolution has brought with it exciting possibilities, new solutions to global challenges, and employment opportunities for jobs that have yet to be invented. At the same time it comes with the potential for technological unemployment that drives downward pressure on income security and social agency while society adapts to the new normal. (Martin, 2017) To adapt to the changing scenario, educational institutions must play a major role and promote innovation and entrepreneurship skills among students. The act of integrating entrepreneurship into higher education further acknowledges that every big idea has to start somewhere, and students, faculty, and staff can be equipped with the tools needed to spark real progress. To keep pace, institutions must critically assess their curriculum and institutional culture and change their evaluation methods to remove barriers that limit the development of new ideas. (EDUCAUSE- Horizon report, 2018)

1. **Collaborations and partnership between Educational Institutions, Analytics companies:**

Educational institutions and companies must pool financial resources in order to expand the digital base of content available to learners. Cross-sector collaborations and partnerships are also becoming more common, with industry looking to institutions for research and development to solve pressing challenges and institutions looking to business to prepare students for the digitally focused workforce, aligning programs and degree pathways with industry needs. (EDUCAUSE- Horizon report, 2018) Legacy tech giants IBM and Genpact are the forerunners in collaborative learning model that also leads to enhanced industry linkage and superior analytics capabilities. IBM has 50 partner colleges as part of their Career Education Program. The Armonk tech titan has set up Software Capability Lab and has added a broad layer of business analytics skills to every management course. Through the tie-up, IBM has set up Business Analytics Lab in the college premises and equipped it with the relevant IBM Software. IBM Subject Matter Experts also train the faculty members and students to understand the application of analytics in business. (Analytics India)

1. **Proliferation of Open Educational Resources/MOOCs**

The MOOCs are the future of today’s distance learning. They have made the education easily accessible to anyone anywhere anytime around the globe and made people’s life more improved. Connecting, informing, composing and educating would be some of the referring words that would be suitable to add when we would talk about MOOCs in the near decade. MOOCs can be the next big thing. The MOOCs and online education have huge potential which would help accelerate and ensure social cohesion and sustainable growth. MOOCs could help make science and technology education accessible to masses but require to develop technical skills among students. The thirst for MOOCs is invasively burgeoning among Indians and they have opted MOOCs for making global classrooms a reality. (Nisha. F and Senthil.V. 2015). The short term innovative impact of MOOCs is that of providing, for the first time, a wide range of people (whether already in or outside formal education) with access to online learning resources and activities in a more or less structured way, with all the potentially life-changing consequences that it entails. The acronym “MOOC” is not used anymore to refer to just one type of course, but to whole range of different ones that include characteristics related to massive open online learning, among others. The emphasis of these courses is no longer, necessarily, on being “open”, but on providing a variety of teaching and learning services to different types of people. (Read.T, Barcena.E & Sedano.B, 2018). The MOOC phenomenon has been used to show that university teaching requires changes that allow adapting to the new ways of knowing, learning, and communicating that exist in a hyper-connected society. (Fueyo.A, Hevia. I, 2018). Best practices Institutions committed to innovating with and harnessing the potential of MOOCs are increasingly looking at ways of integrating MOOCs into the learning experiences of campus-based students, experimenting with MOOCs to push the boundaries and design features of more common virtual learning environments (VLEs), seeing MOOCs as a means of increasing the level of choice and variety of course offerings for all students, taking advantage of MOOCs to help promote readiness and the academic capital of prospective students, exploring ways of offering scholarships for MOOC completion to international students living in developing countries, using data collected through MOOCs to build institutional capacity and capability in the area of learning analytics, exploring the advantages of closer collaboration with other institutions offering MOOCs on the same platform and including conjoint degree programmes. (Brown. Mark, 2018)

1. **New Forms of Interdisciplinary Studies**

Given the multiple challenges facing 21st-century society, the question of interdisciplinarity is urgent. How knowledge is defined and disseminated; how and what students learn; and how higher education can be responsive to its external environment are crucial issues facing educators. Responding to these issues does not diminish the role of the discipline in education, but rather acknowledges that knowledge is unbounded and potential discoveries lie outside compartmentalized structures. (HOLLEY, K. 2017)

Multidisciplinary approaches to higher education are being introduced by institutions that see valuable alternatives to a traditional, singular degree path. Faculty members, administrators, and instructional designers are creating innovative pathways to college completion through interdisciplinary experiences, nanodegrees, and other alternative credentials, such as digital badges. Researchers, along with academic technologists and developers, are breaking new ground with data structures, visualizations, geospatial applications, and innovative uses of open-source tools. (EDUCAUSE- Horizon report, 2018)

1. **Redesigning Learning Spaces**

As universities engage with strategies that incorporate digital elements and accommodate more active learning in the physical classroom, they are rearranging physical environments to promote these pedagogical shifts. Educational settings are increasingly designed to support project-based interactions with attention to greater mobility, flexibility, and multiple device usage. (EDUCAUSE- Horizon report, 2018). Technology can help organize learning around real-world challenges and project-based learning – using a wide variety of digital learning devices and resources to show competency with complex concepts and content. Rather than writing a research report to be read only by her biology teacher and a small group of classmates, a student might publish her findings online where she receives feedback from researchers and other members of communities of practice around the country. In an attempt to understand the construction of persuasive arguments, another student might draft, produce, and share a public service announcement via online video streaming sites, asking his audience for constructive feedback every step of the way. (Office of Education Technology, US 2017)

# IV Conclusion

It can be concluded that technology is going to have a big impact on Education. Cloud learning is going to define the concept of anytime anywhere learning. Learning analytics and academic analytics will help in providing user oriented courses at low cost. MOOCs will provide access of online learning resources and activities to everyone. It will enable the process of reskilling and upskilling convenient for the people already in job market. Multidisciplinary approach to learning i.e. interdisciplinary courses will be in more demand and supply in future. Learning spaces will be redefined to promote project based learning instead of theoretical knowledge. Educational institutions and academia will have to adapt to the changing scenario of education sector to stay in demand. The role of teacher is also going to become even more important and evolve from being an instructor to facilitator.

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