
Future of Higher Education and Technology-Enabled Learning

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Abstract

Technological changes have always influenced societies across the world in multiple fields. Invention of cars in the early twentieth century changed the way we travelled. Similarly, with the advent of telephone, radio, TV, mobile phones, it all changed the way society communicated. Advancements in technology had no impact on higher education and learning until the end of twentieth-century. With the arrival of the commercial global internet by the end of twentieth century, things began to change a little in education delivery. Knowledge was converted into web pages on the internet globally in multiple languages by students, teachers, pedagogy experts, IT experts, organizations (both business and social) and governments to be accessed by all across the world mostly free of cost. Soon internet had trillions of pages of information on multiple subjects. This information could not be termed as knowledge. With the arrival of technology, pioneers like Google (in the year 1998) and YouTube (in the year 2005), this huge information on the internet in the forms of animations and videos expanded the knowledge horizon. The education and learning content on the internet that used to be a mix of information and knowledge and soon became popular due to its unique features. Educational technologies in vogue between the years starting may be the cloud, mobile learning. The content may further be added by open content, MOOCs, tools of learning analytics and virtual labs. Most of the experts in the field of school and higher education doubted the effectiveness of modern technology as it lacked high degree of education pedagogical skills. Added to this may be the ability to improve learning outcomes. Since the first decade of 21st century, period of information technology, internet and digital technology became buzzwords. Therefore, technology firms, governments and educational institutions kept continuously investing in it. However, the next two three decades may witness the emergence of new technology like artificial intelligence (AI), virtual reality (VR), in addition to augmented reality (AR), machine learning (ML), and robotics. They may also witness gamification and simulations in higher education. MIT from Boston, US played an important part in promoting educational technology based higher education by creating Open Course Ware. India too created its open courseware. UGC and AICTE funded creation of Massive Open Online Courseware (MOOC) for graduates and postgraduates through well-trained college and University faculties, namely, associate professors and professors. The government of India created a digital platform "SWAYAM" that hosts all the digital learning educational content from class nine onwards until post-graduation. These courses can be accessed anytime, anywhere by anyone free of cost. MOOC courses and other technology-enabled courses for higher education across the world have come under criticism from students, parents, academia experts in terms MOOC design, assessment methods, learning retention and learning outcomes.

Key Words: Future, Higher education, Technology, Learning, assessment, outcome

Pedagogy in Higher Education- An Introduction

Looking at past two decades of technology-enabled learning premier institute, MIT- open learning is actively involved in conducting path breaking research. It aims to answer most fundamental challenges experts are experiencing on learning pedagogy in technology enabled learning. They are reflecting on technology assisted learning retention tools and techniques. Focus is also on the in-depth study of learning outcomes and assessment methods. Such reputed universities are now researching on-how exactly learning takes place. Finding the most appropriate conditions in conducive learning is another key research area. They are also studying the effectiveness of famous traditional classroom learning methods and techniques like lectures, class work, homework, assignment tests and repeat. Current fundamental research on pedagogy in technology enabled higher education for higher learning outcomes and human values. An in depth research was undertaken with the higher education faculty members involved in the design, production and the delivery of MOOCs, to understand “factors that influence/impact” teaching in online environment. The study revealed that when designing a MOOC, faculty members may give weightage to social values of learning for a broader audience and tend to present content in entertaining and attractive manner with little focus on psychology-based pedagogy.

Technology and Higher Education

With the arrival of technology, pioneers like Google and You tube, huge information on the internet in the forms of animations and videos expanded the knowledge horizon. The education and learning content on the internet that used to be a mix of information and knowledge and soon became popular due to its unique features. Educational technologies in vogue over the years were cloud, mobile learning, open content, MOOC, learning analytics and virtual labs. Most of the experts in the field of school and higher education doubted the effectiveness of such technology as it lacked high degree of education pedagogue skills and ability to improve learning outcomes. Since during the first two decades of twenty first century, information technology, internet, 4G, internet and digital technology have become the buzzwords therefore technology firms, governments and educational institutions keep investing in it.

Academicians, policy planners, and researchers are exploring the impact of technology in the world of higher education. Global Researchers conducted an investigative research on MOOC assessment methods and methodologies by examining multiple-choice questions from a quality perspective. The researchers analysed over two hundred multiple-choice questions across MOOCs and found that more than fifty percent of them were having problems. Some indicated many such online courses which contained more than one lacuna. The study also revealed that propounders of MOOC questionnaire failed to comply with the assessment questionnaire design guidelines. Their research provided a strong evidence that existing MOOC assessment models are highly problematic and unreliable. They are not suitable for granting an accredited degree from a university of repute.

Our aim as planners should be to open up future rather than predict it.

Many researchers explored on theoretical and empirical analysis pertaining to Technology Enhanced Learning (TEL) in higher education. The researchers found that TEL in higher

education has not taken off as a field of research supporting new pedagogy. They further explored that learning retention, assessment procedures and learning outcomes, are still in its early stages. Similarly, human values, ethics and morality have not well taken care of in technology enabled learning.

Looking at twenty years of technology-enabled learning at MIT one can observe open learning system is now conducting path-breaking research to answer most fundamental questions that many experts are raising on pedagogy in technology enabled learning. They also question technology- assisted learning retention tools and techniques, learning outcomes and also learning assessment methods. MIT –Open learning is now researching on; exactly how learning works? Which are the most appropriate conditions in conducive learning? They are also studying the effectiveness of famous traditional classroom learning methods and techniques like lectures, class work, homework, assignment tests and similar tools. Post research, MIT-Open Learning may be creating tools and techniques for classroom as well as technology, enabled learning platforms. In recent times, psychologists and neuroscientists across US and Europe are studying the role of forgetting concepts and knowledge not as a failure of memory but an important critical learning tool. As technology is evolving rapidly researchers in academics and technological fields, are trying to find the answer to the most common question “Will future of higher education be tech based”? If yes, by when? If technology-driven higher education future comes, will it be based on ethics, morality, human values. Will it be based on in depth innate feelings for the learner and society?

Future of learning evolution and workplace in 2030: Since the beginning of the second decade in twenty first century, countries across the world are monitoring the pace of technology and its impact on society. Businesses, workplace, individuals learning and skills. Researchers, subject matter experts and consultants working for various organisations, committees and other platforms had predicted that during the next two decades, businesses, economies and societies across the world would shift rapidly to industrial revolution. Global forums have described a new world which may be driven by newer technologies like Artificial Intelligence(AI), Virtual reality(VR), augmented reality (AR), Machine Learning(ML), Robotics etc .

Boston Consulting Group (BCG) created some possible parameters for future of workplace or businesses based on some critical elements, namely, technology change, talent Learning evolution, with each element having two pace or speed options for example, Technology changes can be accelerated or steady, talent mobility can be High or Low and learning evolution can be High or Low. Based on theory of probability (various permutations and combinations). Many futures scenarios were created for example let's take one of such scenarios out of the various possibilities-Critical elements in pace option one on the parameters of change in technology , learning evolution and talent mobility be steady, slow and low respectively, while in pace option two, it may be accelerated, fast and high respectively.

Interpretations- In this scenario, most jobs within an organization are going to be automated. As pace of technology change gains momentum, the individuals or groups in the society learn at the same speed with that of the change in technology. Technological changes coupled with

fast pace of learning evolution in the society contributes to enhanced abilities in workforce for creativity, innovation, problem solving and dynamism. The main questions then arise how does a society learn, retains and applies learning at rapid pace. What will be the institutional mechanisms where learning delivery will be of high quality. Where learning will be delivered at high speed to very large section of diverse learners and workforce.

Universities of tomorrow and future of higher education :As technology changes acquire rapid pace the education institutes across the developed are experimenting with technologies like Artificial Intelligence(AI), Virtual reality(VR), augmented reality (AR). Experiments with Machine Learning(ML), Robotics etc. Global Universities are testing Virtual Reality based technology where students can learn multiple foreign languages. A global University is planning to offer online degree using virtual reality. Some internet platforms are developing reinforcement learning technology for higher education. Newly Trending and newly emerging Technology corporations and service providers collect learning data. They collect such data from various sources using machine learning and may also provide insights to help diagnose different sets of problems.

In the future, universities across the developed and emerging markets especially among group of twenty nations may possibly shift from the existing traditional version to futuristic ecological university. The overall shift might take some decades to be a reality. Shift from existing traditional Universities to transitional universities might take ten to fifteen years and it may even take another fifteen to twenty years to shift from traditional universities to Ecological Universities.

One type of Universities are existing traditional universities like Cambridge, Stanford, Delhi University or JNU/ IGNOU. In this type, teaching takes place within a well maintained physical structure called its campus where knowledge is transferred by full time faculties and professors. Here university transmits knowledge to the students from the campus until they acquire knowledge in the form of a degree -graduation or post-graduation in a particular field. In the last hundred years, traditional universities have acquired a reputation of knowledge providers, research centres. They are well established for reflection of their wisdom and for their prestigious alumni base. In the last one decade, traditional universities are losing reputation and brand image as they are no more serving as authentic source of knowledge or wisdom to solve multiple and complicated problems that are faced by organization, communities and the society in which they function. The students graduating or passing out of such well established and esteemed or reputed universities are unable to find or sustain jobs. The reason being that as knowledge acquired by them is not aligned to the fast-changing world of business. It is also not aligned to society's new norms, ethics and morality.

In the next few years, slowly some of the institutes of higher education will transform themselves into special kind of universities or Knowledge Universities. They will function as back-end knowledge partners. Or they might be known as factories for providing technological skilled workforce for the future. The pressure of providing employment to students from their parents, media, government and society will force traditional universities to evolve themselves and establish as Knowledge Universities. As technology and

automation will make about half of existing job-roles no more useful or relevant and will create new job roles. Thus it may lead to emergence of hence, new competencies and new learning curriculum with innovative learning delivery mechanisms. Medium and large sized corporates, private investors, technology systems will be the core of Knowledge Universities of tomorrow. Society may probably witness enhanced networking, increased dialogues and debates between multiple stakeholders. Academic experts of repute believe Knowledge universities will emerge as centres of entrepreneurship and may give rise to social and technology entrepreneurs. They might assume the role of solving problems existing with the communities and societies, within or outside the national boundaries. With passage of time, Knowledge universities will comprise of not only students but also may have research interns. They may also have groups of students who will emerge a new class of start-up entrepreneurs. Such start up entrepreneurs may be developed further by subject-matter experts and mentors. These new class of entrepreneurs may set up technology incubation centres with funds donated by alumni, government grants and aids and corpus from large business houses.

Most of the global policy planners and experts, academicians, educationists, researchers and technology experts believe that Knowledge Universities of the future may be transitional in nature. In two three decades they will emerge as stable universities and will be known as “Ecological Universities” or centres for “academic citizenship”. The academic experts believe reasons for shifting from knowledge to ecological will happen due to lack of creativity, virtues, values, ethics and human-to-human interactions. Academic experts believe that the crux of learning is human interactions, emotions that build trust and faith in humanity, which is foundation of the society. Ecological universities of the future will eventually emerge as multi-modal connections of entrepreneurs, students, faculties, researchers, business organizations, social and technology entrepreneurs. Ecological and multidisciplinary universities will be the centres of merging of High Tech Artificial Intelligence(AI), Virtual reality(VR), augmented reality (AR), Machine Learning(ML). Robotics may also be developed with innovation and creativity. Equally important may be morality and values. Also, sensitivity towards natural and other environment, development of less advantaged and marginalized communities, developing self- inner consciousness.

Conclusions and recommendations: To sum up, we can infer that probable actions to manage impact of technology in higher education for better learning outcomes may include manifold attempts and effort. One, the researchers across the globe who may conduct a comprehensive research across countries and various cultures. Researches on how exactly learning works and which ones are the most appropriate conditions in learning to take place in a conducive environment. These researchers should also study the effectiveness of traditional classroom learning methods and techniques like lectures, class work, homework, assignments, ability tests, etc. Two, academic researchers along with technology-based content creators should also research on effective pedagogies for various newer technologies like AI, VR, AR, robotics and together co -create technology. They may also create tools and techniques for enhanced learning retention and learning outcomes. Three, academia should do research on how to integrate at multiple level humanity and technology as part of futuristic curriculum in higher education. Besides technology, human elements namely, values, ethics, morality, culture, inclusivity, equity and

consciousness should be incorporated in curriculum at every level. Lastly, government may also plan to fund research at a holistic level to test the validity of existing technology-enabled learning models and frameworks. Experts may also recommend on future learning models and frameworks encompassing technology based teaching and learning pedagogy, cognitive psychology, neuroscience. Modes of future learning and people development policies, effective implementation of systems and processes may be suitably taken care of for future generations to become job-ready and possess an in-depth knowledge and capability.

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