

Impact of Educational Software And Prerequisites For Digitalisation In Universities And Colleges

Manpreet Kaur Madan

Faculty, Sri Guru Gobind Singh Indraprastha University

Abstract : The 'Digital India' initiative of Honorable Prime Minister Mr. Narendra Modi, has generated innovative endeavors for Millennials/geNext. The ongoing technology revolution can bring large possible benefits for institutions providing higher education. The knowledge economy is the pillar for the development of a nation. The creation of digital strategy and maintenance of reputation requires the acquisition of digital skills and a dedicated research team. Universities must develop the most effective training strategies to prepare faculty for the global pace of transformation in teaching. The process of digitization possess challenge for universities to rebuilt study organization, providing easy access to online literature and software provision. This paper analyses the importance of digital revolution and discusses the issues involved in digitization of higher education and academia and the challenges to overcome for catching up with global competition.

Index Terms: Digital Campus, Digital University, Digital Learning Environment, Digital Employees, Knowledge Economy

I. INTRODUCTION

The new wave of innovation impacts all sectors of the country system. Digitization reshape the boundaries of economic sector. A holistic network approach is necessary to understand the new complex and interactive socio-economic systems. Constant learning and updated skills are the drivers of value creation for the nation. The following research and development and innovation facilities forms an important part in the infrastructure of a country-system:

1. Knowledge capital and technology
2. Laboratories and research facilities
3. Scientific and technological parks
4. Software systems and organizational methods

Universities, colleges and institutions must implement digitalization in order to stay advance. The implementation of Information Technology and Communication - ICT tools in the process of learning, strengthens the educational practice. Kulkarni (2013) presents in his paper that there are numerous universities worldwide that stay busy recruiting students for their online education. In India, institutions such as IITs, IIMs and many other leading Universities and Institutes have started satellite campuses abroad or have tied up with some foreign universities to offer online education.

Innovative teaching makes use of new technologies to increase the size of its student base and increase research participation through enhanced academic excellence.. Classroom practices mediated by ICT have become essential for teacher-student interaction. The use of technology emphasizes on teaching 'Learning by Doing' which exemplifies the way knowledge is acquired in the process of doing things. There is a need for educational community to recognize the existence of a problematic situation in relation to the lack of understanding in basic concepts that significantly affect academic performance and the way of interaction in working area. In fact, nowadays, the entire process of selection of companies is often managed by specific software. Therefore, it becomes the responsibility of the University to equip the students with the digital skills.

However, it is pertinent to mention the fact that mere inclusion of ICT tools in the classroom does not guarantee qualification and pedagogical innovation. The disposition, creativity and visionary spirit of the teachers guides the entire process effectively. Samson and Rathee (2018) has pointed out that the digitalization has it direct impact on the working of the human resource practices and lead to updating in its working procedure.

The University system should not be complicated and the user experiences should avoid misunderstandings on part of staff and students. The need of the hour is the integration and standardization of the services. The Universities that meet the demands of the digital age will see a boost in the years to come. If the management of the University aims to improve student experience, well-groomed students and alumni will automatically act as brand ambassadors for the University.

II. LITERATURE REVIEW

There are several experiences that highlight the positive effects of the use of educational software in the teaching-learning process. According to Milena, Mafia and Andrés (2018), the concept was used of educational software, taking advantage of the great variety of didactic and pedagogical activities, and that allow the student to carry out playful actions to boost the process of teaching-learning. They have focused on the use of educational software by pointing out that this differentiating element along with other hypermedia tools has the greatest impact on the group of students, due to the total involvement with the students, leading them to really want to learn, think and create.

Abrami et al. (2010) discusses the impact of the use of educational software in the increase of motivation of students in their training processes. "The knowledge economy and the bundling of goods and services lead to a different paradigm. An example of the new boundaries is offered precisely by the models of e-teaching and e-learning. The e-lesson is now stored and made available through different e-platforms over time and space. It can be consumed by the students endlessly and everywhere. It becomes therefore a parcel of the available stock of knowledge." (Masera, 2018)

Neeraj (2018), explained that digitization is the process of converting information into a computer-readable format, in which the information is organized into bits. Generating a series of numbers describing a discrete set of points or samples, results in the representation of an object, image, sound, documents or analog signal. This is called as digital representation or digital information for the object and digital form for the signal. The author considers digitization as essential to accomplish more than what we could ever accomplish on our own as technology is here to stay and the best is to learn from it.

"Digitization" is the key corresponding enabling process which is based on the transformation of analogue into discrete digital values in all areas and sectors (Schumann et al. 2018). This was the basis of the internet revolution, which made it possible to blend physical and digital assets. Value creation chains changed and new business models emerged. Dynamic integrated platforms were created by linking together hardware, software and content provisions (Coreynen et al. 2016; Vendrell-Herrero et al. 2017; Gilli 2018).

The knowledge economy can be seen as an extension of the information/internet society. The concept was introduced by Peter Drucker (1969) "from Manual to Knowledge worker". Solow (1956) points out that knowledge generates economic - tangible and intangible -value, which can be incorporated into machines. Knowledge and education become human capital, which is the key productive asset, embodying a large proportion of technical progress.

Correnti (2018) describing the role of Universities states that the role of the education and the higher education institutions is fundamental. It is becoming increasingly central to modernize and enrich academic curricula which should be able to guide students and young people towards the labour markets 4.0, equipping them with the needed skills and knowledge.

Current and future universities are encountering challenges to develop non-traditional curriculum requiring new adult learning models with more personal learning approaches (Halpin, 2012). Review of these challenges will begin with the significant trends occurring in the higher education system. Laying emphasis on the upgradation of skills, Allen (2018) describes that faculty members who are entering the digital revolution in higher education are required to develop competency in navigating diverse learning management systems to facilitate blended learning and online teaching that may also include custom simulation technologies.

However, Brown-Martin and Tavakolian (2014), says that University is challenged by the accelerated process of digitalization in higher education which, among other things, becomes manifest in a pervasive use of information technology for the support of teaching and learning (e.g. time-shifted learning via podcasts, digital materials and annotation or real-time interaction in class. A study performed by Sinclair and Owston (2016), revealed lower motivations for teachers to engage in an isolated online

environment. Some authors have reported reluctance by teachers to use online technology because of feeling overwhelmed by the amount of information and inadequate training that did not result in preparation.

III. RESEARCH METHODOLOGY

The present paper attempts to understand the era of digitization as initiated by the Government and its benefits to the education sector, specifically the higher education. The paper discusses the impact of using Information and Communication Technology along with other teaching software in University. Secondary data was collected from various journals, articles published online, blogs, books and newspapers focusing on the review of literature to achieve the objectives of the study. Identified articles are thoroughly studied to understand the present scenario of education, centering on Digital Campus.

IV. RESEARCH CONCERNS

1. Present Scenario in Education Sector
2. Need of Digitalization in University/ College/ Institution
3. Benefits of Educational Software in Higher Education
4. Impact of Digital Systems in University
5. Prerequisites required to establish Digital Knowledge Economy

These issues are interactive, influential and interrelated with each other.

V. DISCUSSION

Educational Software and the use of Information and Communication Technology

The learning experience can be enriched with the help of ICT in active curricular contents. The technological tools encourage the students for significant learning and their by improving the pedagogical practices. The implementation of ICT tools along with educational software allows to bring positive transformation in learning and understanding the concepts. Internet plays a very active role in the process of acquiring knowledge of concepts and procedures. The massive availability of internet is a point in favor for the development of Digital Campus and creation of innovative learning environment, where knowledge is imparted out of the box.

The principles of flexibility, cooperation and participation are followed for meaningful learning. The close supervision and guidance of the teacher allowed to enrich the skills of the students and be competent to listen, argue, propose and exchange information, based on the resources provided. The multi-formats used for cognitive teaching empowers the development of fundamentals skills and communication processes.

The use of educational software inside the classes and outside of them permits high motivational levels among the students. Creativity in textual production is accompanied with greater spontaneity. The sessions delivered with the digital software establishes great ease and confidence among the students and at the same time strengthens their knowledge at a relatively larger level. When the students become interested and motivated in the interactive activities, new learning are generated through creative work.

Present Scenario of Knowledge Economy

Considerable benefits comes in view from the ongoing technology trends. Changes in student expectations and the methods to deliver teaching is unavoidable factor of higher education climate. Education sector has been recognised as a key to the nation's sustainable growth coupled with creativity in delivery. Technological advances are able to transform economy and shaping the knowledge paradigm. Online and offline infrastructures is indispensable for education. Laboratories centered on information technology, scientific research and upgradation of human capital is reinforcing the knowledge economy. It is, therefore, possible to fully exploit the unleashed potential of cyber-physical systems for the education sector.

It has become imperative to redefine the success in academia which should demonstrate competency with multiple learning management systems. This current approach is reinforcing the academic job market and the way education is delivered. In addition to this, the job search process is the supported by social platforms. Job seekers need to create and maintain a unique brand and reputation out of their skills and capabilities.

Most of the students preconceive ideas about how the University will interact with them and analyse the outcomes in return for their investment. They have gone beyond simple learning and self-development and rather see Universities as chief means of establishing their upcoming employment. This means that employability and student experience lays a great impact on the value proposition of Universities.

Universities globally are trying to improve the quality of education by hiring experience and enthusiastic online teachers. New techniques of innovative teaching has emerged that has been strengthened by digital technologies like MOOC (Massive Open Online Courses). Moreover, famous professors of renowned universities have developed digital lectures to be sold for similar classes in other Universities. Likewise, Indian Institute of Management and Indian Institute of Technology have formulated short-term online courses, comprising digitalized lecture series for under-graduates, post-graduates and also corporate executive.

Students, today's digital natives, are demanding round the clock learning and flexible service solutions. As in the case of online shopping, expectations regarding convenient selection of course, quick overview of course content and comprehensive information with real-time updates are rising among students all across the world. Digitally empowered students use a broad range of online and social media platforms such as Twitter, Facebook, Google Reviews, blogs and emails to share their opinions and experiences and gain knowledge simultaneously.

Omni-channel social platforms act as potential touchpoint for prospective and existing students. These are needed for the purpose of integration of support campaigns for marketing. Universities have started analyzing digitally sophisticated student's needs and behaviour for better segmentation.

As pointed out by Kulkarni (2018), "the students in online class rarely visit the campus, so, traffic, parking and other physical facilities are rarely used. The tuition fees paid by online students is about the same (if not more) as the tuition paid by on-campus students. Many students in online classes appreciate the lack of strict demand on their times. They can study when the time is most appropriate, they can stay away from the traffic and commute and the pace can be selected by them. For some professors the preparation involved can be less taxing than the lecturing on-campus classes."

Role of University/College

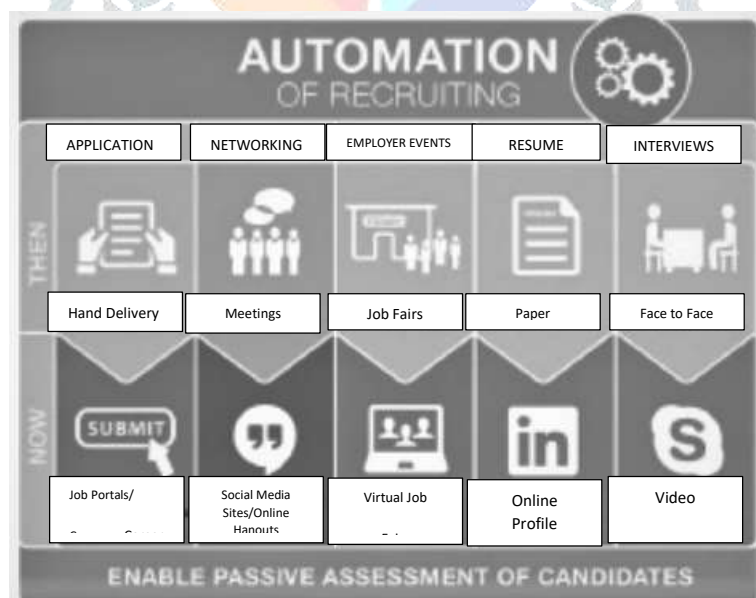
The digital revolution necessitates re-shaping education and training strategies, timely, to face the high demand of digital skills equipped labour market. Universities have to prepare students and executives to handle the challenges of the current automated hiring processes by reinforcing their capabilities. Universities exist to support and promote research for the benefit of Government and private sector organisations. Therefore, for providing an advanced learning environment to on-campus and virtual communities, assistance should be taken from the best technology tools that are robust, secure, flexible and qualify for mobility support. Furthermore, the environment has a very fundamental impact on students and so plays a key role in "delivering positive business metrics for their satisfaction, retention and outcomes". Universities, globally, have recognized this aspect and have been contributing substantial investment to refurbished buildings that not only improve brand value but also deliver the best student experience.

The main elements of a new form of industry includes automation, connection, cloud computing, Internet of Things (IoT), Big Data, System Integration (as represented in the picture below). (Correnti, 2018)



Changes in the selection process are now linked to the social networks and chat and video tools such as Skype. It has replaced traditional methods of job interview (face to face), even in college campuses. Companies have their specific pages on their website labeled as 'Job Opportunities' and 'Career'. Job seekers have to apply on line filling a specific form and sending the resumè with a click of button. Resumè are sent to the companies via e-mail or other job portals like Naukri.com, Monster, Indeed, Shine, Freshersworld, Times Jobs and many more. Applying online has become easy, so the number of applications received by employers have incredible increased.

It has also been seen that some companies engage software for screening of the job applications. These software are sometimes replaced by the human recruiter, which is helping them to manage a huge number of job applications. The picture below summaries the main changes of the selection process compared to the past. (2017)



Comparison of Selection Processes

The recruiting efforts are supported by the use of social media platforms. The recruiters discover the job candidate’s social media profiles in order to decide whether to invite for an interview. The Colleges need to explain to the students the importance of creating a self- brand and maintaining an online present to network with people and companies providing jobs.

The automation of hiring process has certain benefits. Managing the increased the number of applications has become easier and faster. It has also reduced of cost and time involved in the hiring process. Job seekers gain the advantage of applying for an opened job position by just pushing a button. E-recruiting tools helps eliminate the limitations of geographic location as jobs are posted and can be seen by anyone who has the internet access, even from mobile.

The central idea is to equip students with the needed skills to build online personal brand while understanding the new job hunting techniques and thereby enhancing their job search opportunities and their access to the growing and complex labour market. It depends on the real-time applications that provide the organic groundwork for communication, collaboration and information sharing across a modern University.

Updating Faculty Skills by Training

The traditional teaching has been transformed by the upcoming learning management systems. The global trend suggest to develop the most effective training strategies for the faculties. It is important for educators to adapt to change, speak new knowledge, skill sets and learn the new methodologies to survive in the Digital Revolution. The time has come when the Universities should adopt new theories of teaching for the Digital age.

The faculties in higher education must prepare themselves for a future that demands a shift towards the use of educational software and online facilitation. A blend of online and offline teaching, with the help of custom simulation technologies, must be incorporated in the competencies of the faculty members. The multiple learning management systems support various types of modern technology that allows accessibility and mobility.

The University teachers can take the help of Digital Aids for self-directed learning. It includes review of multiple instructional videos, virtual learning centers, webinars and Faculty Development Programmes. Learning which is technology-based, computer-based, interaction-based and multimedia-based needs to be provided to the members of University that enhance knowledge and performance. Employees of Universities can take control of their learning and development while managing work-life balance. Improved level of competency and experience is expected with such training.

Performance management softwares like Workforce Performance Management (WPM) Suite Systems and Talent Management Software are some of the automated and advanced processes that helps to conduct the appraisal procedure online. Rathee (2018) has pointed out that the online payroll has helped in creating general ledgers, making pay cheques and easy disbursement of salary. Movement towards the new cloud computing technology has been made possible by way of digitization.

It becomes the responsibility of University or College to provide state-of-the-art platform and advanced simulation technology to mould the faculty perceptions and adapting to technological change. Digital talent employed throughout Universities and Higher Education Institutions provide the means to co-develop and co-create ideas that are further transferred to the learning of future generation. The enhancement of teacher-student classroom experience is supported with the appropriate choice of technological tools.

Digitization bring up challenges

The IT department of Universities and Colleges worldwide is consistently challenged by the unprecedented process of digitization and also the pressure from business world. The students demand an experience that prepares them for the future that is interwoven with digitization. The service categories of IT support includes study organization, provision of online literature, access of all relevant information, exam administration, granting certificates and uninterrupted software requires timely efforts and technical competence on part of the teachers and students for access.

If online education is done on a large scale, jobs of some established teaching staff comes at stake. Another challenge could be the training and innovation willingness of the faculties, which can be overcome only by mentoring the faculty members.

Some teachers prefer hand-written or print format lecture notes to be delivered to students. The documents to be provided digitally require to be processed digitally as well. Preparing study content and lecture recordings with Digital Aids is perceived as complicated in some cases, if not all. Reluctance by students to go online for education is another challenge. They still study at home using a book or by searching material online on, mostly, unauthentic websites.

The management of courses, admission and registration, students enrolled, daily attendance of students and internal and external examinations are not completely digitized in many colleges and institutions. ICT tools can be utilised for that matter, which saves time. The preparation and administration of results is still, partially, paper-based such as use of Optical Mark Recognition sheets to fill the marks obtained by respective students. A software can be developed by the University which enables the affiliated college faculties to virtually enter the score for further processing.

High data protection on one hand and high usage comfort on the other hand is also a major concern for the IT department of University or affiliated College. Numerous systems co-exist which are unconnected making it difficult for the users to understand different system logics. For example, University library, administration platform, data centre platform, examination department and e-learning systems.

Kulkarni (2018) raised concerns and challenges saying, "If the student wants to cheat the system and take outside help, there are few warranties against less than faithful education. While computers can manage the time for which the tests are allowed to be taken, they cannot control who is the receiver of the question and provider of the answers on the other end. Some kind of written promise or a signed oath of integrity may help in this regard. However, there is not enough police work to completely protect from plagiarism." He also mentions that scheduling tests in a secured environment at the campus for a huge number of online students is difficult.

Rapidly evolving and fierce competition in Higher Education, nationally and internationally mandates Universities to demonstrate that they are able to provide the digital experience by way of new tools and apps. With a substantial number of teaching and non-teaching staff, complex infrastructure and ever-rising bills, managing resources effectively through digital technology poses a challenge and also becomes a requisite.

VI. CONCLUSION

Innovation, research and development in education are the requisite infrastructures for the improved economic, civil and social growth of a country. Traditional lectures and seminars cannot be ignored, still higher education sector demands to go through a fast digital transformation to synchronize all student touchpoints and to gain an edge in the academic world.

Digitization has enabled new models of distance learning in the form of e-learning all across the world. Students are able to study from foreign universities being in their home country. Universities and Institutions have to compete domestically and also have to consider the structures, processes and needs of the internationalised students to improve global rankings in a dynamic market. Opportunities created by Universities for social networking and exchanging ideas are significant recommendations.

Modern Universities and Institutions have started realising their much-needed interactive role as students are gaining more control over designing their education. Individual Massive Open Online Courses (MOOCs) and Open University are leveraging tech-savvy competitors to offer students flexibility and savings. Higher Education Institutions have to integrate data, processes and channels to reap the greatest benefits from digitization. The internal environment has to be evaluated for readiness and ability to change, tap the potential to drive developed outcomes and learning from mistakes through proper support and guidance along the way.

For future research, a quantitative tool can be used to analyse the impact and challenges of application of digitization in Higher Educational Institutions and Universities. An appropriate sample can be collected to know the characteristics of the population that uses such technological tools into academic activities.

REFERENCES

- [1] Kulkarni, Kishore.2013. Digitalization in Higher Education: Costs and Benefits.
- [2] Samson, Honoria & Rathee, Dr. R.S.2018.Digitalization of Human Resource Management: A key towards organization's success.International Journal of Research in Management & Social Science.Volume 6.Issue 1(II).
- [3] Denis, Guerra-Burbano & Rojas-Barrera, Milena & María, Lina & Zabala-Vargas, Sergio.2018.Digital Educational Resources For The Improvement Of Reading Processes And Writing In Elementary School Students.
- [4] Abrami Philip, Savage Robert, Deleveaux Gia, Wade Anne, Meyer Elizabeth, LeBel Catherine.2010.The learning toolkit: The design, development, testing and dissemination of evidence based educational software, "Design and Implementation of Educational Games: Theoretical and Practical Perspectives", pp. 1-21
- [5] Masera, Rainer.2018.The New Triangle Of Knowledge, Technology And Education An Italian Perspective. Università Degli Studi Guglielmo Marconi.Digital Universities. Issue 2018/1-2
- [6] Role Of Digitalization In Human Resource Management", International Journal of Emerging Technologies and Innovative Research, ISSN:2349-5162, Vol.5, Issue 1, page no. pp284-288, January-2018
- [7] Schumann C. A. et al.2018. Smart Approach for the Future of Interdisciplinary Education in Business and Engineering, XII Guide Conference, Università Guglielmo Marconi, Rome, 3-4 May
- [8] Coreynen Wim, Matthyssens Paul, Van Bockhaven Wouter.2016.Boosting servitization through digitization: Pathways and dynamic resource configurations for manufacturers, "Industrial Marketing Management", Elsevier
- [9] Vendrell-Herrero Ferran, Bustinza Oscar F. et al. (2017), Servitization, digitization and supply chain interdependency, "Industrial Marketing Management", V. 60, pp. 69-81
- [10] Cantoni Virginio.2018.Università e impresa nel percorso di trasformazione digitale, in Linda Gilli (a cura di) Il percorso dell'impresa nell'era digitale, Milano, Inaz
- [11] Drucker Peter F.1969.The age of discontinuity, New York, Harper and Row
- [12] Solow Robert M.1956. A Contribution to the Theory of Economic Growth, "The Quarterly Journal of Economics", V. 70
- [13] Correnti, Susanna.2018.Personal Branding And Job Hunting In The Era Of Industry 4.0.Open Educational Resources For Trainers And Students.Università degli Studi Guglielmo Marconi.Digital Universities.Issue 2018/1-2.
- [14] Cauthen L., Halpin J.2012. The blended and virtual learning frontier special report.<http://www.sonicfoundry.com>
- [15] Allen, Pamella.2018.The Fourth Industrial Revolution In Higher Education The Age Of Learning Management Systems.University of Phoenix, Arizona, USA.Digital Universities.Issue 2018/1-2.
- [16] Brown-Martin, G., & Tavakolian, N.2014. Learning {re}imagined: How the connected society is transforming learning. London, UK, New York, NY, USA: Bloomsbury Academic, an imprint of Bloomsbury Publishing Plc.
- [17] Sinclair Margaret, Owston Ron.2006. Teacher professional development in mathematics and science: A blended learning approach, "Canadian Journal of University Continuing Education", V. 32, N. 2, 43 - 66
- [18] Breslow Lori, Pritchard David E., DeBoer Jennifer, Stump Glenda S., Ho Andrew D., Seaton Daniel T.2013.Studying, learning in the Worldwide Classroom, edX. MIT & Harvard.