



Digitalization in the 21st Century – Impact on Learning and Doing

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I. INTRODUCTION

Digitalization is the most trending term in the modern era. It has been over 100 years since the electronic era commenced. We are living in the era of digitalization which has made our lives easier. Technology is capturing every part of the world/lives. The Internet is the new interest. Indian *Guru-Shishya parampare* (tradition) is being increasingly replaced by the Google guru. Digitalization is both a boon and curse to our society. Digitalization is the process of converting information into a digital format, in which the information is organised in bits. Digitalization has made the traditional work of people easy. In schools, colleges, universities and research centre, the application of information and communication technology (ICT) has extended from mere student information system (SIS) to knowledge management system (KMS) and value management system (VMS). Both for the students and teachers who love change and creativity digitalization offers motivational learning and doing things and enhances efficiency and outcomes. As today's marketing emphasises on being "customer-centric" digitalization fits the scheme, increasing the satisfaction of the direct consumers (say the students) and the indirect consumers (say, the employers). ICT is an effect tool and strategy to produce high quality human resources and for organizations to improve their business activities and increase their market shares (Sugandi & Kurniyawant, 2018).

Some scholars note that the new ICTs are not all that new but are mere extensions of modern communication media as the telegraph, telephone, television etc. What is now different is the speed, accuracy, range and reliability of processing the relevant information (Spariosu, 2018).

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From a positive angle digital development affords a new perspective from which to imagine the future directions of a country's political economy. Rather than remaining locked in the paradigm of an eternally developing it now seems possible to aspire to becoming a knowledge society (Sood, 2001). Even emerging countries like India are now models for other countries in this respect. Rural India already wired and non-conventional methods of learning and doing this are adopted. Information kiosks and computer training centres, besides online education can be seen even in the villages of India. As knowledge frontiers keep expanding, income gaps as well as social distances are getting narrowed down. Intellectualism is increasingly enabling people to address cultural issues too. Netizens are now a nation's new asset. Infotainment, knowledge parks have become a reality through modern means of connectivity. Digitalization has been accepted as a powerful tool of empowerment and a way of coming out of marginalization (Hans, 2018).

India's online education market is worth more than USD 40 billion. After the United States, India has been reported to have the second highest number of online course enrolments with more than over 1,55,000 students from the country Making one person in every family digitally literate is one of the integral components of the Indian Prime Minister's vision of "Digital India". Digital India vision promises to transform India into a fully connected knowledge economy, offering world class services at the click of a mouse. This vision aims to change the life in rural India by making every citizen a complete digital literate netizen (<http://www.ictacademy.in>).

II. METHODOLOGY

This study is descriptive in nature. The data has been collected from various sources such as Journals, Magazines and different websites. The major purpose of descriptive nature is to understand the present the trends and issues in education system since digitalization.

III. OBJECTIVES OF THE STUDY

- 1) To understand the transformation of traditional education to modern education.
- 2) To know the merits and demerits of modern education.
- 3) To study the reasons for the change in the education system.
- 4) To make recommendations for new methods of learning.

IV. LITERATURE REVIEW

"Learning is the act of acquiring knowledge, either new knowledge or exploring and modifying an existing one" (Doe, et.al, 2018). Education is therefore, one of the human necessities, and now E-learning is one of the ways to 'do' it (Niavanda & Niavanda, 2012).

What is digital learning? According to the Florida Virtual School, digital learning facilitated by technology that gives students some element of control over time, place, path and/or pace (Georgia Gov., n.d.)

According to B.H. Khan, "E-learning can be viewed as an innovative approach for delivering well-designed, learner-centred, interactive, and facilitated learning environments to anyone, anyplace, anytime, by utilizing the attributes and resources of various digital technologies along with other forms of learning materials suited for open, flexible, and distributed learning environments" (Madhumita & Mishra, 2018).

It is realized that if we kept on teaching our children the way we taught them yesterday, we would deprive them of their tomorrow. Our old educational system lacks the capability to stand a chance in the 21st century. So we are compelled to use digitization in our educational system (Ainslee, 2018).

Digital India launched on July 1, 2015 is a dream project of Indian government to transform rural India into a knowledgeable and digitally empowered society where all information and government services are available to them on a single click. It is a step of the government to motivate and connect rural India to a knowledgeable world. Through this government want to end rural-urban divide. National Scholarship Portal – is a one-step solution for all scholarships provided by government of India right from submission of student application, verification, sanction and disbursal to end beneficiary (Vij, 2018).

In the era of highly developing technology, the artificial intelligence (AI) revolution is predicted to be the fourth revolution of human history after the information revolution. AI has developed rapidly even in India and its effects are felt in varied sectors in terms of efficiency gains and improvements of quality of life. Thanks to high-speed information networks, the rapid development of new technologies has greatly changed our systems of education, society, culture and industry. Sharda (2018) writes:

“India has a unique opportunity to design policy frameworks for promoting the democratisation and distributed ownership of such data that can drive innovation in AI at a large scale. For instance, if medical records from local diagnostic centres across India are fed into algorithms that can predict the probability of developing a disease, the regional, cultural, ethnic and socio-economic diversity of such medical data can allow for the delivery of customised and targeted preventive healthcare at a fraction of the cost.”

B. Subramanian (2018) cites a study by Sinha (2012)¹ conducted to know the extent of Internet Literacy among the 480 users of undergraduate, postgraduate, research scholar and faculty members in Assam University. He found that the younger generation has accepted the Internet as a means for accessing to the relevant information for academic and research works, whereas the elderly people are still comfortable with traditional resources who are using printed resources available in the library, but the

¹ Sinha, Manoj Kumar 2012. Internet literacy skills and internet usage patterns to access e-resources by Assam University library users. *International Research Journal of Library, Information Archival Studies*, 2(1) 010-026,

volume of the frequent usage of e-resources among the users have been found to be at optimum level.

Nanda Kumari & Kavitha (2018) found that today there is high level of awareness on International Copyrights, Inter Library Loan, Indian Copyrights Act and Multiple Format of Copy right/Legal issues associated with the digital archives.

Moreover, as Puja Ahuja says, the online education is easily accessible across the various devices that we are all so familiar with and to top it all, they are eco-friendly too. We get to possibly save a lot of trees from being cut by changing our habits from books made of paper to subscribe to the digital realm (Ahuja, 2015).

However, digitalization is not one-dimensional. Anne-Marieke van Loon, Anje Ros & Rob Martens (2012) from their study of elementary schools in Netherlands concluded that a digital learning task that combined autonomy support and structure had a positive effect on both intrinsic motivation and learning outcomes in students. A digital learning task that only provided structure also had a positive effect on learning outcomes, but a digital learning task with only autonomy support did not yield such results.

Study by Steven Higgins, ZhiMin Xiao & Maria Katsipataki (2012) reveals that the correlational and experimental evidence does not offer a convincing case for the general impact of digital technologies on learning outcomes. Serious questions can be raised about the nature of the evidence base (Hrastinski & Keller, 2007). Of course, ICT and digital technologies do have an impact on learning, but that this is not apparent when looking at attainment (as measured by performance tests), or that it is particularly beneficial for certain groups or learners. It is therefore important to identify more precisely and articulate more clearly where and the use of digital technologies is beneficial.

V. NEW TRENDS IN EDUCATION

1) Online Admissions

Nowadays people need not stand in long queue for admission process like the tradition methods. Applicants can fill their applications online at their convenience.

2) Online Payment of Fees

Payments of fees in modern world can be transferred online from any part of the world and at any time just with the help of Internet.

3) Accumulation of Students on the Same Platform:

With students coming in from various regions, schools and colleges are finding ways to develop an integrated solution to meet the educational needs of all students.

4) Online Teaching

Teaching and learning can be done through live video calls or can learn by watching different tutorial videos from different websites such as YouTube. Cloud computing, e-learning modules, Massive Open Online Courses have already gained

strong foothold in India too. No more is teaching a monologue (lecture). Students and lecturers are able to interact without necessarily being in the classroom and assess each other's work, especially that of the students.

5) Teaching with help of Updated Technologies

Using different technology and software's in can learn or teach. Technology such as Smart Classes and Software's such a PowerPoint will help in teaching. Flipped Classrooms are possible.

6) Digital textbooks

Also prevalent with other names like e-textbooks and e-texts, digital textbooks provide an interactive interface in which the students have access to multimedia content such as videos, interactive presentations, and hyperlinks.

7) E-notes

In the present scenario people or specially the students need not write notes manually. They can either type notes of can search e-book using internet.

8) Fun-filled Learning

Unlike how students feel pressured by numerous assignments and tests in traditional classroom system, virtual reality experience will be more fun and captivating when viewing amazing visualizations and animations through VR devices.

9) Online Examination, Results and Notices

Many developed institutions nowadays conduct online examinations and at the same time they even publish results online so that one can login and view his results. Digital Bulletins replace conventional/physical noticeboards.

The paradigm shift is clearly visible: from machine era to technology era; from physical workplace to virtual workplace; and from worker centric to customer centric. This has made a vast change in the education scenario (see Table 1). So, the roles of the teacher, student, and the society are also changing.

Table1: Learning Roles of Teachers and Students

Method	Teacher	Student
Verbal explanations	Dictate	Listen and Copy
Writing during class	Blackboard / Whiteboard & Chalk / Pen	Copy Notes
Pre-written Transparencies	Overhead Projector	Copy Notes
Pre-prepared Slides	Multimedia Projector & Computer	Printed material
e-learning	Provide Learning Material	Learn through participation

Source: Wikramanayake, G. (2005).

VI. DIGITAL EDUCATION IN INDIA

The fact that India's current educational infrastructure cannot meet the current and future needs of the country is well known. Traditional education has failed to metamorphose in order to be relevant for today's rapidly changing requirements. The rate of advancement of technologies and resulting opportunities is much too rapid for traditional programs and curriculum to keep up. There is a whole world of skills that are not even in the purview of the traditional education system (Arts, hobbies, soft skills, etc.). eLearning will therefore, play a big role in helping bringing a step change to our education problem. As of 2015, India is already the second largest market for eLearning after the United States (Tyagarajan, 2016).

According to a report by the UK-India Business Council, India's e-learning sector was expected to grow at a compounded annual rate of 17.4 per cent between 2013 and 2018, twice as fast as the global average. This, along with the government's efforts towards building a digital future for its citizens with the Digital India programme, and increased investment on Skill India campaign, is shaping an ecosystem which can foster the seamless inclusion of technology in education (Gohil, 2018). E-learning industry in India – that evolved in 2002-03 – is a prolific one, witnessing a steady growth rate of 25 per cent year-on-year and is projected to be a \$1.96 billion industry by 2021 (Kandhari, 2018).

As per a recent report released by KPMG India and Google, *Online Education in India: 2021*, the market for online education in India is expected to witness a magnificent growth of eight times in the five years' period i.e. from USD 247 million in 2016 to USD 1.96 billion in 2021. Such high growth in online education market is projected to be the outcome of increased number of paid online education users from 1.57 million in 2016 to 9.5 million in 2021 (Anand, 2017).

Digital is gaining acceptance across numerous sectors and it is only right that the education sector too reaps benefits of this digital transformation. Today, whether it is finding a new word on Google, or watching a photography video, without realising it, we are already using the internet to constantly learn. A major chunk of learning is already happening on the Internet. Online education is also receiving its due importance in the New Education Policy drafted by the Kasturirangan Committee. Massive Open Online Courses (MOOCs) under the government's SWAYAM initiative have the tremendous potential to make higher education accessible to India's youth that forms more than 50 per cent of our population. Government's push for e-learning reinforces the efforts of online education providers to empower both learners and educators, create more engaging learning experiences and foster personal development. Students will also realise that the accessibility to great teachers can take their learning to the next level. The future of e-learning in India is promising. Location, language and financial resources will no longer be a barrier to a great education. Majority of India's population is incapable of reading or writing English, but thanks to technology, learning material can digitally be made available in regional languages as well (Saini, 2018; Gohil, 2018).

However, we cannot say that the present online education in India is a balanced one. Let's look at higher education, for instance. As compared to graduation and diploma courses, the demand for online higher education is dominated by post-graduation (PG) courses such as MBA and MCA (as evident in the graph below).

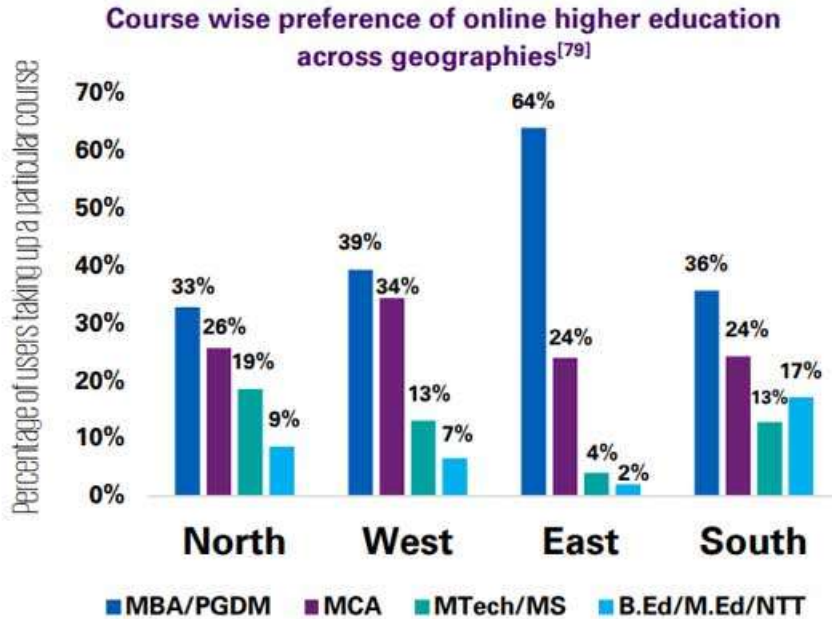


Fig 1: Online Higher Education

Source: KPMG Report: Online Education in India: 2021 (reproduced from Anand, S., 2017).

As is evident in Figure1, tier 1 cities have higher adoption of different types of PG courses such as MBA, MCA, MTech, and BEd/ MEd. However, in tier 2 cities there is a high demand for only those courses that can offer lucrative job opportunities to students such as MBA and MCA.

VII. MERITS OF DIGITAL EDUCATION

Technology, including online education has brought in the following advantages –

1) **Minimizes infrastructure**

Traditional education used to take place in classrooms wherein teachers or lecturers use to teach a group of students using chalk and board method. But in the digital method people can study from any part of the world using digital technology.

2) **Reduces the Cost of Education**

Online learning or digital learning will cost (about 30-40 per cent) less compared to traditional learning. In traditional method people need to pay

management fees and other expenses whereas in digital learning you have no such expenses.

- 3) **24X7 access to lessons**
E-learning can be done 24X7 and from any part of the world. It has no particular time.
- 4) **Student centric Classes**
Students are able to solve problems themselves by investing more learning time using Artificial Intelligence and combining it with both teacher-student and student-student interaction than using traditional classroom teaching methods. Information seeking today is virtually information digging what with data mining!
- 5) **Hypermedia**
Hybridisation is made possible by digitalization. Hypermedia could provide richer information resources using different media (i.e. texts, images, and video sequences) in a more effective manner. The nonlinear, associative, and interactive capabilities of hypermedia can allow students to access information according to their own learning needs, and present multiple related problems in one environment.
- 6) **Pursuing education alongside other commitments**
If people who have various other commitments other than learning they can complete them whereas in traditional education system people may find it difficult to fulfil their other commitments.

VIII. DEMERITS OF DIGITAL EDUCATION

Some of the difficulties in digitalization are –

- 1) **Misguided by the wrong information**
All information given in the internet may not true. In some case it may misguide people by providing wrong or fake information.
- 2) **Major Source of distraction**
While one refers the e-book through internet several advertisements pop out and disrupt the learner.
- 3) **Extinct of good handwriting**
Since there is no manual writing of notes and examinations, one's handwriting may go bad. Hence it leads extinct of good handwriting.
- 4) **Replacing books with e-books**
Hardcopies of books have been replaced with softcopies, pdf, and kindle versions.
- 5) **The feedback might not be enough**
While online instructors do give students feedback, they still might not have enough time to work with them properly, explaining every detail. This could lead to some students falling behind, having gaps in their knowledge, and not completing the course successfully enough.

6) Language barriers

In many countries – with little knowledge of English – people find it very difficult to grasp what the Internet says. Our study also finds that there is poor translation from English to Kannada (the official language of Karnataka) as we see in Wikipedia, Facebook etc.

7) Technology by itself also poses certain challenges: (i) technophobia – the fear of technology; (ii) stop to old best practices like serious reading; (iii) overdoing new habits like “cut and paste”; (iv) less indulgence in methodology (say, not learning how to learn!); (v) systemic failures due to outages, data; and (vi) gap between digital natives and digital immigrants.

8) Psychological burden

Experts including psychologists are of the opinion that “hyper-connectedness” of today’s students can actually lead to increased stress and diminished social skills.

IX. ANALYSIS AND INTERPRETATION

Overall, the research evidence about the impact of digital technologies on learning consistently identifies positive benefits. Such results elsewhere may differ in degree and direction due to the increasing variety of digital technologies and the diversity of contexts and settings in which the research would be conducted, combined with the challenges in synthesising evidence from the studies. Also the policies and provision of infrastructure in general and the Internet in particular make a huge impact/difference.

- Digitalization of economy and education is not an unmixed blessing. Digitalization is a complex programme and evolves with the perception and participation of the stakeholders.
- Digitalization is challenge to future teacher –g(r)o(w)ing across disciplines and gearing global intelligence in the postmodern network society
- Use of ITC being varied – sometimes as a supplement rather than a substitute – digitalization does not provide a full answer to all our questions in study and research
- Tests and training are required in and with ICT tools for research and learning interventions
- Identify what learners and teachers will stop doing: The use of computer and digital technologies is usually more successful as a supplement rather than as a replacement for usual teaching. It is therefore important to identify carefully what it will replace or how the technology activities will be additional to what learners would normally experience.

Overall, the over-arching implication is that the technology is solely a catalyst for change

X. LIMITATIONS OF THE STUDY

The study is not analytical in nature but rather descriptive. Since it is an academic effort, the study was limited by time and cost. Our study linking the provision and use of

technology with attainment tends to find consistent but small positive associations with educational outcomes. However a causal link cannot be inferred from this kind of research. It seems probable that more effective schools and teachers are more likely to use digital technologies more effectively than other schools. We need to know more about where and how it is used to greatest effect, then investigate to see if this information can be used to help improve learning in other contexts. We do not know if it is the use of technology that is making the difference.

XI. SUGGESTIONS

1. More of practical assignments through digital technology should be introduced
2. More of smart work and hard work must be ensured.
3. Adoption of Digital education must be made compulsory but with a fine balance between competence, searching, access, and utilization/discrimination of digital information.
4. More of team work assignments and projects must be arranged.
5. A favourable atmosphere at home is required for children to develop digital competence.
6. Both government and the private sector must initiate measures to build strong communities of inquiry (CoI) with collaborative and constructive approaches.
7. We must give as much importance to ‘connections’ as to ‘content’ in education.
8. Systematic support systems and training for staff and students must be enforced.

Education must be a synthesized process of learning and doing with conventional and non-conventional methods, taking into account the content, context and mode. Health of the IT users must be kept in mind. Altruism seems to be under threat with increasing use of AI in academics and work. We must be watchful of this situation in order to prevent inevitable alienation, avarice, and anger in a techno-scientific world (Mohan, 2018).

Education system creates hope and it should never aim at creating mere hypes, write Nivedita & Veena (2016). Commenting on this statement Satish Kumar Lakshkar on April 4, 2018 in the Research Gate wrote –

“Digitalization of Indian education process:-

It could be considered hype or hope subject to the targeted audience, for whom it is meant for.

Literacy related mission:-Hope: To maximize the reach and contact mass audience, especially in rural areas, the digital technology is much needed.

School/Primary education:-Hope: Small kids easily & more rapidly learns [sic] from Audio-visual techniques .At this stage their brain develops fast & audio-visual learning helps to develop their mind very fast. So digital technology will surely help them.

Secondary/Senior Secondary education: - Hype. As the writing skills, analytical skills need to be inculcate [sic] among students.

Higher education: -Hype: - As creative learning is expected at higher education level. Too much dependency on digitalised technology or internet technology may not lead to the development of analytical thinking.”

XII. CONCLUSION

Through digitalization in education system students have become somewhat lazier. Our system must be more effective so that students work hard. Accessibility to digital technology and accomplishment/impact of digital empowerment offers the learner/researcher a broad spectrum of methodological investigation, taking into account the critical conceptual and practical aspects therein. There is no easy route to digital empowerment. Further the methodological approach keeps evolving and has to adapt to the changing functional, technological and human perspectives of growth in general and inclusive growth in particular. Therefore it is wise to ‘blend’ or mix technological and human approaches that strengthen the enabling and evaluatory mechanisms of digital empowerment. We recommend further research on ‘mixed’ approach (i.e. models and practices) to learning and not just e-learning in a broader framework of life-long learning.

To conclude in the words of Ilona Hetsevich (2017) -

“e-learning can become a great addition to the traditional learning process, making it more diverse and allowing students from all over the world to gain additional knowledge about certain subjects. However, it’s important to develop both types of educational technologies equally and learn how to combine them in a most effective way in order to get the best results.”

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