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Digitalization in higher education

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Abstract
We are running into the 21st century where technology knows no bounds. This is the phase of radical development where technology is taking over every niche and corner. Smartphones, laptops, and tablets are no more unknown words. During this phase the education system is evolving for the sake of betterment, as this generation's students are not born to be confined by the limits of simple learning; their curiosity is vast and cannot be catered with educational systems that were designed earlier. 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. *"The beauty is in finding the right balance between online and in-class learning, and the best way to make progress is to experiment with different combinations,"* says Pierre. *"The world of online learning is constantly evolving, and it is hard to predict where it is all going, with digitalization set to affect different disciplines in different ways. If we wait for it to be perfect before we get involved, then we will never get involved, which would be a pity. It's a matter of familiarizing oneself with digital tools and platforms and using trial-and-error to figure out what works and what doesn't. So we are compelled to use digitization in our educational system.

Keywords: Digitalization, higher education.

Introduction
Digitization and Digitalization?
Digitization is the process of converting something that is physical and analogue into something that's virtual and digital. For example, if we see in the last decade, everything from movie, books and music has been made available in the digital format.

Digitalization on the other hand, represents a perfect convergence of human values such as empathy, newer business models and unprecedented technology prowess. For example many banks today are not just in the business of earning income through interest rates on loans. They are creating a thriving economy of apps which provides seamless lifestyle solutions to customers. Digitalization therefore can be defined as a new way of doing this by leveraging technology to create customer experience, to become agile and unlock new value.

Digitalization
"The digitalization of higher education mainly affects the second segment: dissemination," Pierre explains. "The truth is that online teaching is enhanced in some aspects but also downgraded in others. You can compare online learning to a textbook, but textbooks in which people will also be talking to you and asking you questions. However, unlike a textbook, online learning provides more tutoring and guidance as well as a rhythm (thanks to deadlines), with greater incentive to be assiduous about covering the material.

It is true, though, that an online setting does not provide certain elements of the in-class experience - notably, a lack of personal connection. In a classroom, there is a lot of interaction between participants, so people get to know each other and learn from one another. Having met someone physically increases personal connection far more than is

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possible online, even with webcasts and video conferences. Such limitations are why, for me, ideally online learning should not be a substitute to in-class learning but rather a complement to it." "But there are other advantages too. Notably, digitalization opens up higher education to people who wouldn't be able to afford or access it otherwise, such as people living in remote locations. Similarly, digitalization makes it possible for some people to pursue higher education with less disruption to their lives. Individuals who are already managers in a company, with heavy workloads and important responsibilities, may find that online learning makes it easier to combine their professional and family commitments. The possibility with online learning to access your sessions when you want and learn at your own pace is a major advantage for many students. It all very much depends on individual learning styles and short or long-term professional goals."

Component of Digital Education
Primarily Digital Education has 3 components:
- The content
- The technology platforms
- The delivery infrastructure

To understand in better way let's take an example of BYJU's, one of premier organisation offering digital education for school sections, college sections and various competitive exams. They claim they will make teaching a fun experience for your child. They are offering good content for each section covering all the academic details. All the portions are loaded in digital tablet by Samsung or Lenovo. They are having good delivery infrastructures, once you have placed ordered as per your requirement, the product will be delivered at your place and thereafter they will give online demo to use the same.

Benefit of Digital Education
1. Benefits for Academic Institutions
Academic institution can easily manage their activities with the help of digital education. Some of the important benefits are:
- Saving time and money of the Institution.
- Institutions can easily plan to conduct online exam and publish the exam results quickly.
- It helps in creating interest among student which will help them in learning many concepts through interactive- audio-visual teaching contents.
- Easy communication between Institution and parents for student related academic activities.

2. Benefits on the side of Students
As all the study contents will be taught in the classroom through multimedia slides, it creates interest and enthusiasm among the students. Learning will be fun for them. They are able to memorize many concepts through interactive audio-visual teaching contents. Some other benefits to them are:
- Students can easily view their daily time-table, class assignments, any events planned in school etc. from home.
- Students are able to prepare projects and presentation online.
- Students can appear in online exam and view their results.
- They can easily collect teaching contents of missed lecture online.

- They can access library online.

3. Benefits to Parents
In today's world, it is difficult for parents to visit the school or colleges because of their busy work schedule. Digital education helps the parents to view all the information of their ward from comfort of their home or office. Some of the other benefits are:
- The web facility of digital education helps the parents to view their child's attendance record, progress in syllabus, timetable, etc.
- They can easily check the subject taught in school, homework given to their ward, any future assignments and projects and guide the ward accordingly to participate and practice.
- Parents are able to view internal and semester exam schedule and results.
- Payment of school fees and other activity charges are easier for parents.
- Information on various school events, notices, holidays and can track the presence of ward in the classroom /outside the class.

4. Benefits to Teachers
Digital in education also creates interest among teachers. It helps them to make teaching interaction among students very effectively. Some other benefits are:
- Teachers easily manage their class time and teaching content effectively.
- They can easily avail the school as well as class related information through web.
- Teachers can check daily time-table, assignments, teaching history, events and holiday list, self as well as student attendance etc.
- It helps in explaining the difficult content easily and in effectively.

5. Benefits to Principals
Some of the important benefits to principle are:
- For a Principal it is easy to manage all the school/college activities.
- In case if the he is on leave, he will be able to access all the school information online and manage the school easily.
- Teachers' teaching progress and students' performance can be checked easily by Principal
- It will helps in allocation of class and subject to a teacher according to his/her interest and experience.
- He can assign tasks to other staff members and give remarks for their works.

Scope of digital education in India
Globally India holds an important place in the field of education. There are more than 1.4 million schools all over the country having over 227 million students enrolled across different fields and more than 36,000 higher education institutes. India has become the second largest market for digital education after the US. However, there is still a lot of scope for further development in the field of digital education. There are some major investment and developments that have been taken place to promote the digital education in India. Some of them are:

- NIIT, which is pioneer in Training and skills development is planning to offer online courses from leading international universities to about 5 lakh people over the next three years with US-based edX.
- A digital education start-up, Byju's, has raised US$ 50 million from the Chan Zuckerberg Initiative, founded by Facebook founder Mark Zuckerberg for the development of digital education in India.
- Online and classroom-based certification courses offered by Neev Knowledge Management Pvt. Ltd under the brand name EduPristine has raised US$ 10 million from Kaizen Management Advisors and DeVry Inc for the development of digital education in 15 cities across the country.
- Intel Corporation, a US based multinational technology firm is planning to provide optimised learning solutions and extended computing technologies to students and schools across the country.
- In the field of information technology, the Cisco Systems plans to invest US$ 100 million in India over the next 2 years for the development of digital education which will include opening of six new innovation labs, which will help to train around 250,000 students by 2020.
- Tata Trusts which is the part of the Tata Group and Khan Academy are starting web-based free learning portal to provide free digital education in India.
- Ignis Careers and SEED, Hyderabad-based education start-ups are working to provide low-cost school education with the help of digital technology.

Ways that digital technology is changing the face of education
Digital technology is revolutionizing the face of schools and education on a global scale.

1. **Learnings Texts Are Now Digitalized:** Check the backpack of many high school and college students, and you will find that physicals textbooks are slowly being replaced with iPads and various forms of devices connected to online media. With the fast-paced development of online media, e-books, e-readers, and learning programs developed for iPads, iPhones, and smartphones, the textbook is becoming "extinct" in some areas. You can forget the time when your backpack was loaded down with a stack of textbooks, because learning is going online.

2. **Availability of Online Classes and Programs:** One of the first easy observations regarding digital technology and education is that online schools and classes are becoming widely available. Even free online classes called "MOOC's" otherwise known as Massive Open Online Courses are becoming widely popular. Online courses and full online programs are making it possible for learners young and old to unite from all over the world at any given moment, and to have easy access to a course or program from home.

3. **Mobile Learning:** A combination of the result of the sharp and sudden increase in the availability of online courses and programs, and the wide availability of online resources and books, you can now study from your phone. MOOC's such as the well-known "Future Learn" MOOC allow you to access your course(s) from your smartphone. Just open the course, plug in your headphones, and follow the content and the classroom discussions! Whether you are riding the subway or taking a bus or a train you can instantly connect to the world full of learners and learning.

4. **Collaboration and Peer-to-Peer Learning in the Classroom:** With an increase in access to online learning, whether part or full instruction is provided online, increased opportunities for students to collaborate together from a variety of places becomes possible. Student bodies, in turn, can be made up of students from all over the globe, with every continent represented. Diverse student bodies also increase diversity in ways of thinking and contributions to class discussions and projects. Inside and outside the classroom students can work together through online platforms and portals to exchange ideas. Students can express ideas and communicate through programs provided by their schools, and also informally through social media programs such as Facebook, Twitter, and Pinterest. Peer-to-Peer learning has become increasingly popular as students share their ideas with each other through online discussions and share documents through programs such as Google Docs. Teachers are encouraging and setting up classrooms that inspire and sometimes require peer-to-peer discussions

5. **Personalized Teaching and Learning:** By using devices and programs to distribute classwork and assignments, teachers can personalize lessons and focus on the work of each student. Individualized lessons can be provided to each student, and learning tools enable students to work, perform, and excel at their own pace. Due to the increase in the presence of technology in the classroom, teachers now have more ability to personalize lessons, instructions, and projects for each group or childTeachers can also now provide feedback, grades, and reports directly to students through online platforms, and online school portals and log-ins.

6. **Data Driven Instructions and Results:** Another change that is occurring due to the rise of digital technology is the increase in data-driven instruction and results. Although some teachers are being forced to use online grading tools and devices, analysis tools are also becoming more precise. These devices and grading tools can provide more accurate results regarding student performance, but can also result in a teacher's limited ability to judge a student's performance based on the content of their writing, classroom performance, and other contributions.

7. **Guidance and Instruction from Diverse Teachers:** The increase of digital technology has also affected the availability and access to diverse teachers and instructors for students worldwide. One student can be present in a multi-cultural online classroom with teachers with origins from South Africa, England, Brazil, Spain, Russia, and Poland all at the same time. Teachers from different backgrounds and countries all bring their own unique perspectives, cultures, and languages to the table of learning.

Technology trends that pushing up digital education in India

Today, India is one of the world's top destinations for education. With some of the best colleges and universities, it is renowned for its excellence and high standards. What's even more interesting is how technology has advanced rapidly to transform the way students in India consume educational content. Additionally, the penetration of internet-based smartphones is taking quality learning to students across geographies in India.

Today, little children are watching their favorite cartoons and learning pictorial rhymes on the same device. Education is being imparted to them through flexible and non-intrusive formats.

India might not have readily adopted education technology but it's heartening to see how a traditional sector like education is using technology as an enabler so far. Today, some cutting-edge technologies are being used to further enhance this sector, while grabbing the attention of entrepreneurs, venture capitalists, corporates and governments. Here are the factors that are enabling the growth of digital education:

1. Personalised and adaptive learning

Learning platforms, softwares and digital devices are together creating countless new ways to modify education. This way, the academic potential, strengths, weaknesses, aptitude and learning pace of every single student is catered to. Precise, mobile and reliable applications are being created to teach students, help them practice their learnings, take assignments and manage their schedules. The 'one size fits all' teaching model is being supplemented by adaptive, personalized learning pedagogies. Going forward, this will be the new trend in formal learning that will enable students to be technologically skilled and equipped for modern workplaces.

Schools are now providing their students with digital devices like desktop computers, laptops and tablets. These devices are aiding them in the teaching process while also helping them understand how students learn and how to enhance their learning process.

2. Mobile-based learning

Over the past few years, mobile learning has picked up by the populace who have gradually assimilated it in their lives. The smartphone user base in India continues to increase, in both urban and rural areas. The coming years will witness users accessing most of their educational content through internet powered smartphones in a massive way. Most educational content, including even online courses, will be optimized entirely for mobile devices. It has offered students the flexibility to access educational content seamlessly across multiple digital devices like desktops, laptops, tablets and smartphones.

3. Two-way conversations in E-Learning

In the traditional classroom seating scenario, students are unable to get the individual attention they need due to time constraints. In contrast, the one-to-one context of learning in digital mediums currently students to learn through videos and chat with an expert.

The upcoming 'Learning Management System' will continue the two-way communication model between students and experts. More importantly, it will let students track their coursework progress, identify improvement areas and offer ways to make the most of them.

Through the help of 'Big Data', experts will be able to capture student feedback within the framework of the content provided. With this alone, they'll be able to improvise and enhance their offerings in new ways to further benefit students.

4. Video-based learning

Video lectures allowed students to learn subject syllabi at their own pace and dedicate time spent in class towards interactions. This will continue to be a trend in the future where students will have access to rich and interactive content, that will be useful for both formal training as well as performance enhancement. Video learning has always appealed to students since it closely mirrors the traditional classroom teaching style. Earlier, students watched video lectures as a form of homework and then discussed them during the next class. Over time, this habit brought about a remarkable improvement in their performance, with a noticeable improvement in grades. The increase in video-based learning on mobile devices will eventually account for 80 per cent of all internet traffic by 2019.

5. Usage of Virtual Reality (VR) and Augmented Reality (AR) for learning

Virtual Reality and Augmented Reality are already buzzwords in the technology space. Their advent in e-learning has massively impacted the efficiency with which it is offered to students and the way it assesses their performance.

VR allows students using e-learning platforms on mobile devices to directly interact with study material. This keeps their engagement levels high and motivates them to learn more and better. On the other hand, AR facilitates teachers and trainers in performing tasks, they previously haven't or cannot, in a safe environment.

Together, the both of them are engaging students in ways like never before and are poised to become a lot more widespread in their usage and impact in the future.

6. Open educational resources

Open digital education resources have commonly been used in distance learning courses. They consist of freely accessible media for learning, teaching and research purposes. They are licensed to be revised and disseminated freely by teachers among students. This allows the latter to gain access to an extensive arrive of study material that is otherwise restricted indigenously.

Open educational resources also facilitate the creation of a flexible environment where teachers can customize educational content for individual sessions or classroom sittings. This is applicable for typical curricular subjects like mathematics, sciences and languages, as well as business and fine arts.

Challenges of digital education

Some of the major challenges for digital education in India are:

- **Language and content related Challenge**

Languages is one of the main barriers for the development of digital education in India, there are several different languages in different state have been spoken all across

country, pushing all the digital content in all these regional languages some time becomes difficult for the agencies.

- **Shortage of trained teachers**

A major obstacle in the use of digital education in rural area is the lack of knowledge and skills. There is a shortage of teachers, formally trained on digital technology. In some of the academic institution in rural areas, school teacher and college professors are not interested in using digital tools for conducting classes. In rural areas, primary teachers and senior teachers are reluctant to get trained and adopt digital technologies for digital education in school because they are in view that these disruptive technologies are out to replace them permanently.

- **Poor maintenance and upgradation of digital equipment**

In rural areas maintenance and upgradation of digital equipment is one of the major challenge. This is largely due to budgetary constraints by government. The digital education projects in rural schools are not self-sustainable. At initial stage various projects have been launched by government for the development of digital education, but later, they have not been taken due care for the maintenance of digital equipment which is affecting the digital education development in rural areas.

- **Resource and internet connectivity related challenges**

One of the main challenges for digital education in India is poor internet connectivity in rural areas and some part of urban areas. Majority of population across India has still no access to internet and a large population in rural areas is still illiterate in the field of digital technology. More Innovations required to make the digital education more interactive and robust.

- **Insufficient funds**

Digital education involves effective and efficient usage of appropriate and latest hardware and software technology available in the market. Through Digital India programme, the government has promised availability of funds for technology implementation but lack or insufficiency of finances leads to redundant and obsolete infrastructure and equipment's in rural schools. In developing countries like India, digital technology implementation into education systems is a difficult task as it requires huge funds and infrastructure.

Conclusion

Digital learning occurs across all learning areas and domains. Digital education gives win-win opportunities for all, at one side School, colleges and other institution finds the rapid rise in enrolments and added revenue because of digital education, and on other side students view this as a flexible and alternate option allowing them to study as per their convenient time and pace. Teaching and learning becomes a smoother experience as it includes animations, gamification and audio-visual effects. Over the last few years digital education in India is evolving at faster pace. It is changing the way students learn different concepts and theory in school and colleges. The traditional chalk and talk method in school and colleges has been slowly changing with more interactive teaching methods as schools and

colleges are increasingly adopting digital solutions. Digital learning guarantee more participation from students as the current generation of students are well-versed with laptops, I-pads, and smartphones.

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