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# Role Of Technology In Dispersion Of Education In India

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# ROLE OF TECHNOLOGY IN DISPERSION OF EDUCATION IN INDIA

**Abstract**

Use of technology has become a common practice in today's world. Ongoing technological advancements have not only impacted the businesses but also have changes the way of living of the society. With constant changes in technology occurring at greater pace, this has resulted into use of new and innovative methods which is regularly disrupting the established marketplaces across the world.All industries are experiencing this 'disorder of the conventional things' and 'emergence of new ones' form time to time. This fact holds true even for the 'education'domain. As the world is moving rapidly towards digital media, the role of IT in education has become increasingly important. With the help of technology, now learning has become bidirectional and interactive. It is possible now to provide personalized learning experience in the form of one-to-one specific and flexible learning experience. With rise in penetration and usage of mobile devices (especially smartphones), organizations are recognizing their importance. Due to increasing usage of smartphones, now most of the educational content, including even online courses, will be enhanced completely for mobile devices. This paper tries to focus upon two things Firstly; it exhibits the shift in imparting education from a traditional approach towards modern approach that uses digital technology. Secondly, it lists some of the factors that are acting as drivers or push factors for the technology based learning in the future. This paper also illustrates some examples of the overall impact of digitalization.This is ably supported by encouraging policies and decisions from the government. The work hasbeen analyzed using secondary data, & is therefore qualitative research based. Finally, the outcome drawn from the said paper exhibits that digitization of education will be an ongoing process and may involve news tools and techniques as the technology developments will take place in the future.

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**Keywords**

Innovation in Education, Dispersion of Education in India, Digital Education, Education using Innovative Techniques, Technology Assisted Education.

**Objective**

The main objective of this paper is to understand the shift in imparting education from a traditional approach towards modern approach that uses different technologies as tools.

**Methodology**

This paper mainly based on secondary data. The articles which are published on or about digitalization or technology use in education have been collected for the study.

**Introduction [1] [2] [3] [4] [5] [6] [7] [8]**

In most commonly understood language Digitization is defined as 'a change of analog signals into digital signals'. Digitization can be used in the context of online learning, video lectures, e-books, etc., which may facilitate students the experience of an interactive learning environment.

It may be observed that online learning has been used now days. In India it has started with the concept of distance learning or distance education by IGNOU. It is leant that IGNOU has digitized 95% of its printed material and uploaded it for reading. National Programme on Technology enhanced Learning (NPTEL) is started in 2003, which is a joint effort of the IIT's (seven Indian Institutes of Technology) and IISC(Indian Institute of Sciences) for promoting technology in imparting education has also come up for providing the further enhancements so as to strengthen the spread of digitized education. Hence, use of digitized techniques has made the teaching methods of continuing education easier, diversified and beyond time and geographical boundaries.

 

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Thus, with the emerging trend of digitization across the globe a new vision for learning practices is required to be evolved &adopted in Indian education landscape, such that a combination of technology and education is blended together to have novelty in imparting the education that arouses interest, quest for learning & recreational means from education making it enjoyable experience.

The modes of teaching in higher education have drastically changed in last 15 years. While some old guards still stay with the old "Chalk and Talk" method, it is very rare that in these days professors do not use some modern technology in class room delivery.

Abundant information on any subject is available on various sources such as "You Tube", "Facebook", "Wikipedia" and "Google". The online education therefore has added new options of learning, has created a wide variety of new courses, content in diversified format and has increased the enrollment in many academic institutions.

This type of delivery has some substantial benefits and conveniences. It has no geographical or regional boundaries, so the internationalization of education has become a common phenomenon with satellite campuses mushrooming all over the world. New ways of learning and teaching may include development of new content or information and communication technologies such as cable and satellite transmissions, audio and video conferencing, PC software and CD ROMs and in particular the Internet based sources.

This wide variety of means increases the accessibility to the rest of the world. This is achieved by promoting extensive use of a mixed learning model, wherein:

- Massive Open Online Courses (MOOCs)* are developed locally (in India) and are combined with those provided by the top global universities.
- Lectures delivered by local faculty are supplemented by pre-recorded lectures given by best-in-class faculty from the top institutions.

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- Through the Massive Open Online Course (MOOC) platform, students from around the world would have seamless access to high-quality content generated by elite institutions, recorded lectures of renowned faculty, a dispersed and diverse peer group, and certification from reputed universities, global and Indian.

Some of the examples are:

- Two community colleges in Massachusetts have launched a mixed learning program utilizing in-class sessions and material from an existing MOOC offered through edX by MIT.
- The IITs are planning to offer basic IT courses in data structure, programming and algorithms through the MOOCs platform, for which credits would be awarded and counted towards degrees conferred to thousands of students across higher education institution in India.

- Coursera – pioneer in offering MOOCs
    - Launched in 2012; partners with top universities and organizations in the world to offer massive open online courses (MOOCs) for free.
    - Offers 535 courses in a wide range of topics, spanning humanities, medicine, biology, social sciences, mathematics, business and computer science.
    - Has partnered with over 100 universities including the likes of Stanford University, Princeton University, the University of Michigan, and the University of Pennsylvania.
    - Have 4.3 million users currently, with Indians being the second biggest segment after Americans.

- Adoption of the MOOCs model by higher education institutions in India.
    - IIT Bombay – edX partnership: edX, an international provider of MOOCs, has partnered with IIT Bombay to make courses

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developed by the institutions available to students around the world.

With the growing use of technology in education a new way of imparting education has become popular. This is 'distance education'. According to All India Survey of Higher Education - AISHE 2017-18report, distanceeducation has become a useful mode of obtaining degrees for large number of students who are staying in far off and remote areas and for whom accessing universities on regular basis is still a dream. Distance enrolment constitutes 11% fothe total enrolment in higher education, of which 42% are female students. Level wise distribution of students under distance mode is shown in Exhibit 1. At all Levels share of male student is higher than females except Certificate course.

Exhibit 1: Gaining an Education – Level-wise Distribution of Distance Education Enrolment (In Nos.) [7] [8]

| Level | Distance Enrollment | | |
|---|---|---|---|
| | Males | Female | Total |
| **Post Graduate** | 6,12,906 | 5,65,601 | 11,78,507 |
| **Under Graduate** | 15,67,538 | 9,86,873 | 25,54,411 |
| **PG Diploma** | 51,658 | 38,421 | 90,079 |
| **Diploma** | 72,223 | 50,521 | 1,22744 |
| **Certificate** | 36,313 | 49,289 | 85,602 |
| **Integrated** | 178 | 73 | 251 |
| **Total** | **23,40,816** | **16,90,778** | **40,31,594** |

Looking at the State-wide variation, out of the total reported enrolled students pursuing studies through distanceeducation;six states of India areproviding education to around 61.3%of the students, according to the AISHE 2017-18 report. These states areMaharashtra 17.8%, Delhi 15.8%, TamilNadu 11.6%, Kerala 6.2%, and West Bengal 5.3% and Uttar Pradesh 4.6%.

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Distance Mode is mainly conducted by universities and majority of the students (54.7%) enrolled in Universities and their Constituent Units are studying under distance mode which can be seen from the Exhibit 2. At Post Graduate, Under Graduate, PG Diploma, Diploma, Certificate level share of distance enrolment in university is 29.6%, 64.3%, 2.3%, 2.5% and 1.3% respectively. Distance Enrollment at Integrated level is negligible.

Exhibit 2: Gaining an Education - Comparison between Regular and Distance Enrolment in University(In Nos.) [7] [8]

| Level | Regular Enrollment | Distance Enrollment |
|---|---|---|
| **Ph. D.** | 1,39,218 | 0 |
| **M. Phil.** | 17,912 | 0 |
| **Post Graduate** | 7,97,694 | 11,77,430 |
| **Under Graduate** | 19,80,564 | 25,53,590 |
| **PG Diploma** | 63,514 | 77,754 |
| **Diploma** | 1,64,698 | 99,199 |
| **Certificate** | 15,417 | 52,607 |
| **Integrated** | 1,13,611 | 0 |
| **Total** | **32,92,377** | **39,73,020** |

Thus, it may be proposed that there is a transition of education system that has taken place from conventional ways to futuristic approach that uses distance education which is using various formats of digital technology. The schematic showing generation education mechanism is presented in Exhibit 3.

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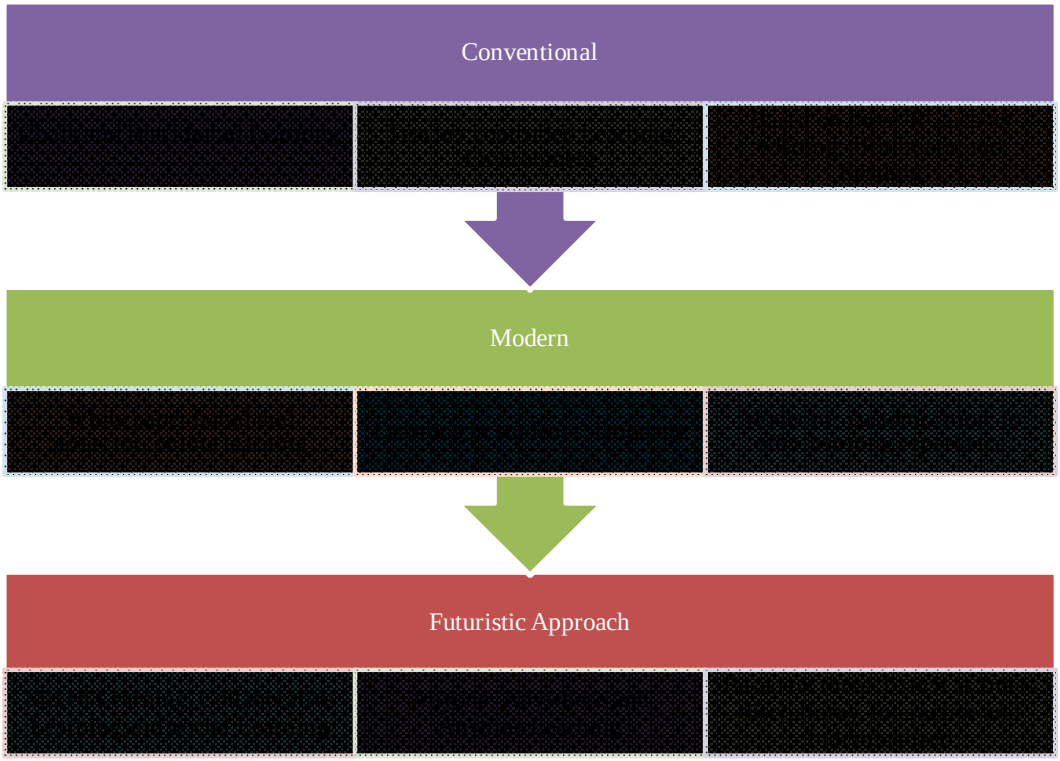
Exhibit 3: Shift in Education System – Conventional to Future [1] [2] [3] [4]




**Drivers of Digital Education in India [9]**

Today, India is one of the world's best destinations for education. With a portion of the best schools and colleges, it is well known for its excellence and high standards. What's significantly all the more fascinating is the manner by which innovation has progressed quickly to change the way students in India expends educational content. Also, the widespread availability and usage of smartphones is bringing quality to students across the geographies in India.

Today, little children are viewing their most loved kid's shows and learning pictorial rhymes on a similar gadget. Instruction is being granted to them through adaptable and non-nosy organizations. As a result, students over all age bunches are finding the delights of learning and having a ton of fun while at it. There has been a detectable move in the impression of guardians and instructors see computerized adapting as

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well. Today, organizations are attempting endeavors to move the emphasis back on students to reexamine the manner in which they learn ideal for the duration of their life.

India probably won't have promptly embraced training innovation however it's encouraging to perceive how a customary division like instruction is utilizing innovation as an empowering agent up until now. Today, some bleeding edge innovations are being utilized to additionally upgrade this division, while catching the eye of business people, investors, Corporates and governments.

Here are some of the drivers that are pushing the growth of digital education:

*One to One specific and Flexible Learning*

Availability of learning portals and web sites, related content and digital devices are together bringing in enormous options of transforming the education. Along these lines, the academic potential, strengths, weaknesses, aptitude and learning pace of every single student is taken into account. Systematically designed contents matching specific student needs are being developed to impart learning to students. This in turn helps them practice their study, enable them to rehearse their learning, take assignments and deal with their timetables.

Now days students are getting access to wide range of gadgets (such as desktop computers, laptops and tablets and so on) through their schools and colleges These gadgets are supporting them in the learning process while additionally helping them see how students learn and how to augment their learning activity.

*Bi-Directional Talk in E- Learning*

In the conventional classroom seating situation, students can't get the individual consideration they require because of time limitations. In contrast, with the personalized kind of learning possible using digital devices, now students can learn through videos and interact with an expert.

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The upcoming 'Learning Management System' will continue the bi-directional interaction between students and experts. All the more essentially, it will give students a chance to track their coursework progress, identify areas to improve, and offer approaches to take advantage of them.

*Mobile assisted Learning*

Over the past few years, mobile assisted learning has gathered momentum and gained popularity bypeople who havesteadily absorbed it in their lives. It has offered students the adaptability to get educational content flawlessly over different advanced gadgets such as desktops, PCs, tablets and mobile devices.

The cell phone 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 significantly. Due to increasing usage of smartphones, now most of the educational content, including even online courses, will be enhanced completely for mobile devices.

| Mobile based Learning – BYJU in India [10] | |
|---|---|
|  | Mobile learning in Asia and particularly in India is on the rise, thanks to high smartphone penetration rates. The mobile learning startup, BYJU is a learning app for Indian schoolchildren. BYJU's mission is to battle the "one-size fits all" approach due to unfavorable teacher-student ratios and to also facilitate a mindset shift in India's schools. Students should be driven by their love of learning and not the fear of an impending exam. BYJU creates a personalized, visual learning experience for students via mobile app which includes watch-and-learn videos, rich animations and interactive simulations developed by their in-house content team. |

 

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*Video assisted Learning*

Video assisted learning has dependably engaged students since it intently reflects the conventional classroom educating style. Prior, students watched video lectures as a form of homework and afterward examined them amid the following class. After some time, this propensity achieved a noteworthy change in their performance, with an observable change in grades.

| Video based Learning – Khan Academy in India [11] | |
|---|---|
|  | About Khan Academy<br>Khan Academy offers practice exercises, instructional videos, and a personalized learning dashboard that empower learners to study at their own pace in and outside of the classroom. Subjects covered are mathematics, science, computer programming, history, art history, economics, and more. |

Video lecture facilitates learning by the students at its own. Students can learn subject syllabi according to its convenience without disturbing the classroom based interactions. This trend will be continued in near future where students will have access to quality and intuitive content. This content will be helpful not only in performance improvement but also in formal preparation.

*Open Education Resources*

Open education resources (those using digital technology) are most commonly utilized used in distance learning courses. They consist of freely accessible media for learning, academic 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.

 

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Open educational resources encourage formation of an adaptable environment where instructors can modify the educational content for singular sessions or classroom sittings. This may be applicable for standard curricular subjects such as mathematics, sciences and languages, as well as business and fine arts.

**Newer Areas of Education to Evolve [12] [13] [14]**

As stated earlier, the increasing impact of technology in education is evident and is helpful in reaching it to all. This will give rise to newer areas of learning with emphasis on more specialized course content.

A little glimpse into the dynamic digital world is demonstrative of how technology and innovation has given a radical new significance to education and learning. It has changed everything in our lives – what we thought we knew, what we were familiar with – and has helped us investigate new dimensions to accomplish our destinations all the more viably and productively. This is likewise valid in the field of education, where it has contorted the specific texture of conventional learning and reached out to us new and more developed learning approaches.

The rapid increase in internet connectivity has been an important catalyst for the growth of e-learning. A proliferation of technology based education (edtech) platforms in the Indian landscape is slowly eliminating barriers in the access to quality education. This will give rise to newer areas. Some of these are as listed below:

*Virtual Reality (VR) and Augmented Reality (AR) as Learning Tools*

Virtual Reality (VR) and Augmented Reality (AR) have become popular expressions in this technology era. Their advent in E-learning has enormously affected the effectiveness with which it is offered to students and the manner in which it evaluates their performance. VR permits students using e-learning platforms on mobile devices thereby having direct access and interaction with study content. This keeps their participation and commitment levels high and in turn propels them to learn more and

 

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better. On the other hand, AR encourages educators and mentors in performing tasks; they beforehand haven't or cannot, in a safe environment.

Together, these two are connecting students in ways like never before and are poised to become a lot more widespread in their usage and impact in the future.

*Cloud based technology in Education*

Enhanced IT abilities and undertaking framework at schools are expected to make an effective advanced learning background. While the technology exists in some forms, the real challenge comes in terms of scalability. The biggest advantage of cloud technologies is that they create a centralized repository of knowledge for students and teachers to access. This is taking the student-teacher relationship beyond conventional classroom session.

Cloud-based technology in education has become such a phenomenon since it ensures sustained academic learning irrespective of the student's geographical positioning. Moreover, it ensures that the desired data is centrally available for processing and deriving deeper insights for a more effective learning experience. Cloud-based technology also enables educators to boost their reach without making any significant infrastructural spends. This, in turn, benefits end-users by reducing the cost of services, while simultaneously adding value to their education.

*Artificial Intelligence (AI) and Machine Learning [13] [14]*

People might question how artificial intelligence actually affects a student's learning potential and enhances human intellect. Well, AI is turning academic training right on its head. AI-driven algorithms create behavioural models by studying individual data sets. Based on these models, the algorithms develop a deeper understanding of a student's strengths and weaknesses and devise a unique personalized learning curve.

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Artificial Intelligence (AI) emphasizes on creation of intelligent machines which work and react like humans. It finds applications in speech recognition, learning, planning, and problem solving, healthcare, logistics and so on.

Machine Learning is subset of AI which uses statistical methods to enable machines to improve experiences. Deep learning is another subfield of machine learning concerned with algorithms inspired by the structures and functions of the brain called artificial neural networks.

Machine learning, a constituent technology of AI, enables the system to learn individual actions and skills without explicitly being programmed. The system automatically establishes the relationship of different learning methodologies with respect to different behavioural models, progress reports, and annual results. They, moreover, create personalized training paths that exact the needs of each and every student. The student ultimately benefits by learning at an optimal speed – delivering the best results.

As mentioned in earlier paragraphs, open educational resources such online courses, open access libraries are helping students of AI. Events such as Hackathons are providing right exposure to coding skills.

In an increasingly digitized economy, managing requires more than simple number crunching. The connected world is producing a lot of data for humans to handle and AI is becoming necessity for managing business and innovation. Inevitably managers must learn to work with AI in order to perform in new world. Helpfully, managers do not have to learn AI form the scratch. There are many data and machine learning platforms which offer data analytics and AI development services to others. For many business heads, the main attraction of AI is reducing manpower cost and speeding up operations. AI is new age career. It opens career opportunities in private companies, public organizations, education, healthcare, government agencies and so on.

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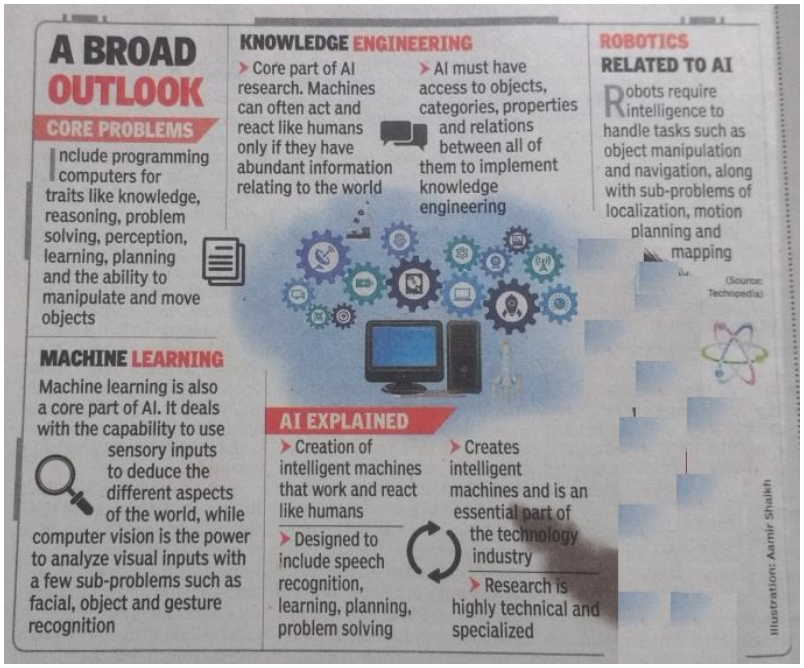
A broad outlook of AI is presented in Exhibit 4.

Exhibit 4: Artificial Intelligence – A Broad Outlook [14]




Some of AI applications in the education domain are presented as Exhibit 5, Exhibit 6, Exhibit 7, Exhibit 8 and Exhibit 9.

Exhibit 5: AI in Finding Jobs [13] [14]

| **AI In Finding Jobs** |
|---|
| A McKinsey Global Institute study has estimated that by 2025, online talent platforms could enable as many as 60 million people to find work that more closely suits their needs, skills and preferences and reduce the costs of human resources management, including recruitment by as much as 7%. |

Exhibit 6: How AI Helps Students? [13] [14]

| **How AI Helps Students?** |
|---|
| According to McKinsey AI could empower students by providing them with control over how fast they learn, and the lifelong feedback of one's own |

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| |
|---|
| cognitive and behavioural preferences? Empowered by AI, students can build virtual robot teachers to help them navigate lifelong learning. |

Exhibit 7: AI in Education and Jobs [13] [14]

| **AI in Education and Jobs** |
|---|
| EdTechXGlobal and Ibis capital have estimated that, globally, schools spent nearly $160 billion on education technology, or edtech, in2016. The spending will grow 17% annually through 2020. Private investment in educational technology; broadly defined as the use of computers or other technology to enhance teaching; grew 32% annually from 2011 through 2015, rising to $ 4.5 billion globally. |

Exhibit 8: AI in Creating ‘smart content’ [15]

| **Creating ‘smart content’ for improved interactivity** |
|---|
| Content Technologies Inc. (CTI), an AI research and development company, develops AI that creates customised educational content. Using deep learning to absorb and analyze existing course materials, textbooks, and course curriculum, the technology creates custom learning materials, including textbooks, chapter summaries, and multiple-choice tests.<br><br>A recent hackathon conducted by NITI Aayog also featured ‘ReadEx’, an android application that does real-time question generation using NLP, content recommendations, and flashcard creation. |

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Exhibit 9: AI in helping in 'drop out' prediction [15]

| **Microsoft is helping in predicting drop outs in Andhra Pradesh** |
| --- |
| The Andhra Pradesh government is making concerted efforts to bring down the school dropout rate in the state. It has tied up with Microsoft to address this complex challenge. Based on specific parameters, such as gender, socio-economic demographics, academic performance, school infrastructure and teacher skills, an application powered by Azure Machine Learning processes the data pertaining to all students to find predictive patterns.<br><br>With these data insights, the district education officials can intervene and help students who are most likely to drop out. A variety of programs and counselling sessions could be conducted for these students and their parents.<br><br>The Andhra Pradesh government, based on machine learning and analytics, has identified about 19,500 probable dropouts from government schools in Visakhapatnam district for the next academic year (2018- 19). |

The increasing influence of technology in education is, thus, offering us a glimpse into a gradually evolving realm of unconstrained learning. Today, if we are able to deliver despite an outmoded education system, imagine what wonders the next generation will accomplish, once it has been trained with advanced pedagogical methods. And since these systems are witnessing increased adoption with every passing year, we won't have to wait much longer to see the results.

**Expectations from Digital Education [12] [16]**

Ongoing technological advancements have provided benefits to several sectors of the economy and education is no exception to this fact. In this context, let us have a glance at the expectations or yet to come attractions of this digital education.

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The ongoing advancement of digital education is nothing short of a revolution. The world has seen educational efficacy changing digitally with each passing day. It has not just given instructors and students boundless educating and learning openings, individually, yet additionally enhanced students' knowledge, cooperation in the learning procedure and development.

The following are some of the forthcoming expectations that show the advancement of digital education:

*Social Media as tool for Learning*

Social media has advanced progressed from being a simple networking means to a learning tool. Today, numerous instructors and colleges consolidate internet based life into their educational programs, making it a basic piece of the e-learning background. Aside from having the capacity to share data anyplace, whenever, this pertinent instrument is likewise a responsive method for keeping students connected with and intrigued. They are much mindful of current issues, trending issues, social activities and upcoming career opportunities, consistently.

*Going into the Hinterland*

Nearer or local markets such as rural market is developing and growing faster than the established ones. Availability and affordability of high-speed internet and direct-to-device advancements are empowering rural students to get quality resources and education, anywhere and anytime. These have also empowered them to spare time and money.

*Acceptance and Growth of Interactive Learning*

Digital education is never again kept to a classroom. With the appearance of virtual classroom, terms like flipped classroom, collaborative learning, formative assessment and mobile learning have become popular. The learning process over the years has been made more attractive, fun filled and engaging through these models. Different educators have thought of interactive learning modules that exhibit a decent harmony

 

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between proactive recreations that entertain and those that impart educational qualities and values.

*Gaining from the Best*

Global discussions, universally trained instructors, premium courses and reputed institutes have embraced change and development. Sitting in the solace of one's home, one can approach the best authors, researchers and specialists. This has upgraded learning and brought about a rich teaching culture. In fact, about three fourth of the institutions offering online learning say it is crucial to their long-term strategy.

**Technology is forging alliance to spread Education [17]**

Ongoing technological advancements have provided opportunities for domestic institutions to explore opportunities. In this context, domestic institutions are forming alliances with global institutions to improve their credibility by offering the courses from reputed institutions abroad. This is the now happening as ten institutions have been selected under the scheme RUSA (RashtriyaUcchchatar Shiksha Abhiyan), to promote excellence, with the condition that the money is spent by 2020. These ten high performing state universities across India are set to undergo Rs. 100 Crore upgrade each this academic year for which they will receive funds directly from the centre. In addition they will also get foreign mentors.The list of institutions and their mentors is presented as Exhibit 10.

Exhibit 10: Indian Universities and their mentors [17]

| American University | Indian University | Area of Collaboration |
|---|---|---|
| **University of Pennsylvania** | Osmania University | Education, Innovation |
| | Jammu University | |
| **University of California, Berkeley** | Jammu University | Bio-technology and data science |
| | Jadavpur University | Blockchain, data services |

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| | | |
|---|---|---|
| | | and economics, |
| | SavitribaiPhule Pune University (SPPU) | Start-up accelerator programme |
| **Purdue University** | Andhra University | Pharmaceutical and manufacturing |
| | Sri Venkateshwara University | Pharmaceutical and cancer research |
| **Northeastern University** | Utkal University | Development impact lab and technology park |
| | Sri Venkateshwara University | Entrepreneurship and Innovation |
| **Drexel University** | SavitribaiPhule Pune University (SPPU)<br>Osmania University<br>KurukshetraUniversity | Innovation and Entrepreneurship |
| **Cornell University** | Alaggappa University | Life Sciences |
| | Guru Nanak Dev University | Agriculture |
| **University of South Florida** | Guru Nanak Dev University<br>Jadavpur University<br>Jammu University | Entrepreneurship and Innovation<br>Sports Science |

**Conclusion [12] [16]**

To sum up the things, it may be possible to have a convergence of digital and physical universes, with the web becoming far more available, reachable and accessible. The industry is never again divided; there are players as of now who are putting forth a suite of courses to cater to the changing and dynamic needs of accessible students.

The authorities have a role here too. They may think of having certain approaches and or policies that will help support the online education market. Quick implementation, enhanced digital infrastructure and it quality supported with reasonably proceed

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broadband services across the country will help encourage the utilization of inventive and innovative educational tools.

Most professions have already witnessed drastic changes in the way they work, thanks to technological developments, and digital education is not far behind. It is possible that a myriad of potential outcomes before us and there will be numerous which will go beyond the limits of our imagination.

Ongoing technological advancements have provided opportunities for domestic institutions to explore opportunities. In this context, domestic institutions are forming alliances with global institutions to improve their credibility by offering the courses from reputed institutions abroad.

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