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Disruptive Technologies - A promising key for Sustainable Future Education

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Modern disruptive technologies have changed almost every aspect of our everyday lives. Education is not an exception to this rule. Excitement about the role of technology in improving education is a good thing. Education is a segment that needs disruptive innovation. Today's global economy requires technologists to take the lead role in innovation and idea generation, although innovation is not a topic that is typically included in the curriculum.

Traditional curriculum creates people who are efficient researchers and highly productive, but this approach does not encourage creativity or innovation. A computer inserted between faculty and students forces faculty to think a new about what a course aims to achieve rather than to continue with existing ways of designing and delivering a course. Technology prompts a pause in the usual thought patterns, encouraging reflection. Eventually a new understanding of how learning happens and what a course could be emerges.

Research has found that educational technology, when used effectively, can significantly improve teaching and learning. The impact of technology on educational achievement is expected to grow with improvements in software and hardware. The educational resources of

the Information Superhighway are growing rapidly. However, many students and teachers particularly those in high-poverty or rural schools and colleges have little access to these resources.

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Disruptive technologies

Online Learning Probably, the first thing that comes to mind when we consider how disruptive technologies changes education is the capabilities of online learning. This disruptive technology has already transformed the way of how educational organizations provide their services. Online learning offers new opportunities both for students and educators. This disruptive technology can involve those people that don't have access to traditional forms of education due to some reasons. Since online learning is easily accessible, parents, fully-employed people, and people with disabilities can use this opportunity to get an education without leaving their homes.

Chat-based Collaboration Platforms allows users from all around the world to participate in the educational process. Additionally, professors can have experts from their field join the discussion online to speak with students directly. Advancements in online learning technology are helping make higher education more impactful and accessible to more people than ever before.

Competency-based Education (CBE) is the approach implying that all students enter the educational program with different skills, and each of them has different speed of learning. The primary task is to measure these differences and create adaptive learning programs. The goal is to increase student engagement in education and avoid the situation when students have to learn what they already know. CBE allows making the educational process more individual-focused, which results in more efficient learning. If a learner needs more time to focus on a

particular topic, CBE systems allow this need to be precisely measured. This disruptive technology in education has enabled pedagogy to meet the needs of students that don't fit match the strict criteria of a "traditional" learner.

Virtual Reality is about gaming and entertainment. But it combines the best of in-person and online education in an immersive experience. This is a very realistic and cheap way to visit unthinkable scenarios. VR allows recreating very cheap yet realistic scenarios useful for those who study medicine, archeology, physics, and other subjects.

Artificial Intelligence (AI) can use the algorithms that will help to personalize the learning experience. AI systems can learn how a particular learner interacts with knowledge and analyze the needs of an individual or the whole class. At the current level of technological development, AI systems in disruptive education already can do personalized tutoring and moderate discussions.

Case-based/project based instruction studies are effective in education because they bridge the gap between theory and practice. Students also report being more engaged in coursework when case studies are included in the curriculum. Although effective, case analysis is not as prevalent in the classroom as the more traditional lecture-based instructional methods.

Augmented Reality (AR) in education, learners can get the possibility to understand the concepts better thanks to the use of 3D models. AR allows adding a new layer of information to physical reality using a Smartphone or tablet. Using this disruptive technology, teachers can provide attractive presentations that will attract students' attention even in the case of an uninteresting topic.

The Internet of Things The Internet of Things has opened up a whole new world of possibilities in higher education. The increased connectivity between devices and "everyday things" means better data tracking and analytics, and improved communication between student, professor,

and institution, often without ever saying a word. IoT is making it easier for students to learn when, how, and where they want, while providing professors support to create a more flexible and connected learning environment. With the help of IoT technologies, predictive analytics can provide additional insight into how students are doing both in the classroom and on campus. With the right infrastructure in place, universities will be able to respond to early indicators of an “at-risk” student at the critical moment before that student’s performance begins to suffer. The potential that IoT offers Higher Ed is seemingly only restricted by the creativity of those implementing it

STEAM (Science, Technology, Engineering, Arts and Mathematics) Learning is the focus area in schools these days and programs which motivate and encourage students to perform project-based activities to deep learn a concept are mushrooming everywhere. Programs like YouCode which run in India's rural areas, teach AI to school children of classes 6 to 8. A full suite solution like EdSense seamlessly combines project based learning with robotics, math lab, soft skills lab, AR/VR Lab, programming, design thinking tools and proper maintenance support.

Gamification This is an educational approach which enhance learning outcome by using video game design, game elements and interactive features in learning environments. It increases the human engagement and makes learning more fun. It is a reward-based system where a students earns a badge or a sticker for every school activity that they do correctly. Minecraft, Mathletics are some of the popular gamification apps that are in use across many schools.

Immersive Experiential Learning Mixed Reality tools like Microsoft's HoloLens, Google Expedition and Windows 10's mixed reality viewer blur the lines between real and virtual worlds and provide experiential learning to students sitting in the classroom. Many mobile educational AR apps are being developed which is especially useful in a country like India which has around 29 million smart phone users already. Apps like Google Expedition take the user on a virtual tour across the world and provide multi disciplinary learning to students.

Blockchain The blockchain technology is new in the space of education sector but will soon become a key technology aspect especially in terms of digitally storing certificates and diplomas and personal data of applicants. The Indian government is pushing for this through Niti Aayog's project IndiaChain.

Conclusion

Technologies change the habitual way of doing things in different spheres of our lives. Education is not an exception to this rule. Applying modern disruptive technologies in education, you can achieve the following benefits:

- Efficient recording and sharing of educational materials
- Personalized learning
- Automated student data management
- Efficient analytics and reporting
- More profound progress evaluation

Disruptive technologies provide the possibility to get a modern education to those people who can't learn in traditional educational institutions due to scheduling issues. Web-based software allows applying for the services of educational organization and learning without leaving your own house. Chat-based collaboration platforms improve the interaction of students. Competency-based education allows creating educational programs according to the individual possibilities of a particular student. Such technologies as Artificial Intelligence only begin to apply in education, but their potential gives grounds to hope for great prospects.