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Use of Innovative Technology for Effective Learning: An Empirical Perspective

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Abstract
"Technology in the hands of great teachers can be transformational", says the famous author George Couros. Technology and education are a great combination if used together with a right reason and vision. While technology has changed how we communicate, access information, work and even play, its impact on schools and colleges, teaching and learning has been much more limited. We believe that the limited impact is primarily due to lack of consideration given to technology's comparative advantages. These comparative advantages, relative to traditional "chalk-and-talk" classroom instruction expand opportunities for practice and increase student engagement. Through the use of technologies and innovative methods in education, one can alleviate problems and carry out one's tasks and activities in a well-organized manner. The paper will try to focus on how technology through the use of knowledge, tools, techniques, systems, and methods provide solutions to problems or serve certain purposes to effective learning.

Keywords: Education, Impact, Innovative, Knowledge, Technology, Tools

INTRODUCTION

With the rapid changes of technology in our world the saying arises- "If we teach today as we taught yesterday; we rob our children." -John Dewey

The response to this saying is the focus on Innovative Learning Environments which may produce a drastic change in both our society and might help in lifelong learning process. The intersection of technology with our rapidly transforming educational landscape is framing the nature of technology in education in profound,

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new ways. New and emerging technologies are provoking a re-conceptualizationof teaching and learning, while also serving as catalysts for transformation and innovation.

Successfully preparing all learners with the skills and capacities for 21st century citizenship— global awareness, creativity, collaborative problem-solving, self-directed learning—is no small order, and many sectors find that the traditional forms of education that have evolved through the end of the last century are simply inadequate for achieving these goals. Finally, dramatic advances in educational technology have inspired powerful new ways for learners to engage with all kinds of content and activities in their own self-direct learning experiences. The juxtaposition of these three events creates a very interesting challenge and opportunity—a space to reconsider, re-imagine, and re-invent learning environment and methods which would enable every individual for effective life-long learning.

THE DRIVE OF EMERGING TECHNOLOGIES IN THE FIELD OFEDUCATION

While many system of education seek to improve there methods of education through technology but changes in technology isn't the only factor that affects the way of education. However, there are severalkey drivers pushing technology as a key component for educational system change, and these serve ascentral reasons that educators and education stakeholders should consider the growing relevance andimplications of technology and technology-based school innovation.

- Technology can perform several key functions in the change process, including opening up new opportunities that improve teaching and learning.
- The skills for an adult life include technological literacy, and people who do not acquire and master these competencies may suffer from a new form of the digital divide, which will impact their capacity to effectively operate and thrive in the new knowledge economy.
- Technology is an integral part to accessing the higher-order competencies often referred to as 21st Century Skills, which are also necessary to be productive in today's society.

Students today are constantly surrounded by a constellation of digital device. The GenZ lives and further generations lives too are hugely going to get affected by the emerging technologies . Not only that highly dependent on technology up to the extent that their social and cultural practices would not be as they are if digital media were not available anytime, anywhere to them. Through this research work we are explaining that "*students are not only accessing, managing, creating and sharing knowledge in dramatically different ways as their teachers often do, but also have radically new expectations regardingwhat a quality learning experience should be*." As a result, students are bringing attitudes, beliefs and perceptions to learning environments around their own learning experiences there, and the role that technology should play in it.

Technology use in the drive of education for 21st century

Educational technology is the process of integrating technology into education in a positive manner that promotes a more diverse learning environment and a way for students to learn how to use technology as well as their common assignments.

Virtual Reality:

How can Virtual Reality help to improve the education? Many countries around the world continue to use antiquated methods for learning. It is no good for the students because they do not learn all of knowledge that the teacher teach in class. For that throughout years technology has been a great help for teach to the students

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in a good way. However, this time Virtual Reality has been implemented like new technology.
The characteristic that it has can be implementing in education because with this tool the students can learn by using their senses like hearing, sight and touch. Therefore Virtual Reality is one of the most deviceful tools for schools to teach natural sciences since it is an innovative way of teaching, it uses technological elements and it adjusts to student's different learning styles.

Likewise , the Virtual Reality is an innovative and creative form to teach because it permit work in others environments such as a person can stay in a rocky mountain and learn about this place. Moreover, the student that use this tools can learn through experiences since it tool is able to do that the person can immerse in the scene and learn to the sound, images and weave. Finally, the students can improve their knowledge with different innovative tools like Virtual Reality that with its characteristics can teach to the playful way.
Virtual reality can be used to enhance student learning and engagement. VR education can transform theway educational content is delivered; it works on the premise of creating a virtual world — real orimagined — and allows users not only see it but also interact with it. Being immersed in what you're learning motivates you to fully understand it. It'll require less cognitive load to process the information.
Here are just a few properties that make virtual reality in education so powerful.

Better sense of place

When students read about something, they often want to experience it. With VR, they aren't limited to word descriptions or book illustrations; they can explore the topic and see how things are put together.
Thanks to the feeling of presence VR provides, students can learn about a subject by living it. It is easy to forget that VR experiences are not real — a body actually believes it's in a new place. This feeling engages the mind in a way that is remarkable. Technologies such as science labs are amazing — they allow students to understand how things work based on practical experience.
"A relatively small VR device can even act as a whole science lab." It is a well-known fact that people learn best by doing; however, if you inspect modern education, you will see how little learning actually happens by doing. Students are focused on reading instructions rather than using them in practice.
VR in education provides an experience anchor to the instruction. With VR education, learners are inspired to discover for themselves. Students have an opportunity to learn by doing rather than passivelyreading. It is a well-known fact that people learn best by doing; however, if you inspect modern education, you would see how little learning actually happens by doing. Students are focused on readinginstructions rather than using them in practice. VR in education provides an experience anchor to the instruction. With VR education, learners are inspired to discover for themselves. Students have an opportunity to learn by doing rather than passively reading.
"With VR, they aren't limited to word descriptions or book illustrations; they can explore the topic and see how things are put together." Virtual reality in education is on the horizon, and without a doubt, it will change the world as we know it. Twenty-first century classrooms will be technologically advanced places of learning, with VR technology significantly increasing students' engagement and learning. VR experiences will inspire a whole new generation of young and bright students, ready to innovate and change the world.
At the same time, the next big thing in education no longer relies on technology, but rather on a teacher's decision to push forward and adopt these technologies inside the classroom. The global goal should be to make knowledge available, accessible, and affordable for everyone on the planet.

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Cloud technology:

Smartphones, tablets, laptops and desktops are increasingly commonplace classroom tools, and they're all linked to an array of educational resources thanks to cloud computing. Combining cloud computing and education has helped schools in several ways. Shifting IT services to an offsite environment saves administrators from having to spend money on updating software, managing servers and installing security measures. And many schools do not have enough IT personnel anyway, so trusting a third partyto store and manage data in a cloud environment takes the burden off for education budgets.

BENEFITS OF CLOUD COMPUTING IN EDUCATION

- *Reduces IT and data management costs.*
- *Increases accessibility to course materials.*
- *Allows students to work and collaborate virtually.*
- *Let educators complete tasks and track homework online.*
- *Makes it easier to switch to virtual learning when needed.*

The accessibility of data in the cloud is another advantage. Because students can instantly store and retrieve materials on remote servers, they can work from wherever there is an internet connection and collaborate with classmates without having to be in the same room.

Teachers have also benefited from cloud technology. The cloud provides a secure and reliable internet connection, which enables teachers to adopt online platforms for assigning and tracking homework. Withall their resources in the cloud, teachers can pivot to virtual learning as well. This flexibility has made cloud computing a boon in education, allowing entire school districts to better serve their students.

With cloud-based software, it becomes possible for educational organizations to have virtual classrooms for the students. The concept reduces the infrastructural costs to a considerable extent. They can even reduce the expenses of onboarding regular teachers in their faculty. Rather, they can collaborate with skilled trainers who work remotely and serve as cost-effective resources. At the same time, teachers can create and deliver online courses to students anywhere. Students can even appear for virtual exams, saving their time and expenses effectively.

Another benefit of cloud computing that you cannot ignore is extensive cost savings. Both learners and providers can experience big benefits in this context. Students need not invest in expensive books and applications as these learning resources are available on the cloud. Providers too can lower the management costs by simplifying processes such as enrollment and assignment tracking. And of course,the infrastructural costs reduce too, as explained before. The best part about cloud computing is that youpay as you go, which makes it cost-effective.

Cloud computing in the education industry brings the opportunity for the students to expand their horizons. Those who are not happy with the traditional learning systems can now explore the new conceptof online education. This works wonders for students who want to opt for remote learning or even pursue courses overseas. Working professionals who are unable to attend conventional classes but want to upgrade their skills can also take virtual classes.

The benefits of cloud computing for the education sector are immense. It does not come as a surprise that major providers in the industry are fast embracing cloud tech so that they can enhance the services they deliver. Simultaneously, the cloud is emerging as the best option for the students as well. Nothing matches the convenience of accessing learning at the fingertips and cloud tech makes it possible. Whetherit is a large

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university, a small school or a student, everyone in the industry is experiencing the positive impact of the cloud and things are going to get bigger and better in the future.

Artificial Intelligence:

AI has already been applied to education primarily in some tools that help develop skills and testing systems. As AI educational solutions continue to mature, the hope is that AI can help fill needs gaps in learning and teaching and allow schools and teachers to do more than ever before. AI can drive efficiency, personalization and streamline admin tasks to allow teachers the time and freedom to provide understanding and adaptability—uniquely human capabilities where machines would struggle. By leveraging the best attributes of machines and teachers, the vision for AI in education is one where they work together for the best outcome for students. Since the students of today will need to work in a futurewhere AI is the reality, it is important that our educational institutions expose students to and use the technology.

Differentiated and individualized learning

Adjusting learning based on an individual student's particular needs has been a priority for educators for years, but AI will allow a level of differentiation that is impossible for teachers who have to manage 30 students in each class. There are several companies such as Content Technologies and Carnegie Learning currently developing intelligent instruction design and digital platforms that use AI to provide learning, testing and feedback to students from pre-K to college level that gives them the challenges they are ready for, identifies gaps in knowledge and redirects to new topics when appropriate. As AI gets more sophisticated, it might be possible for a machine to read the expression that passes on a student's face thatindicates they are struggling to grasp a subject and will modify a lesson to respond to that. The idea of customizing curriculum for every student's needs is not viable today, but it will be for AI-powered machines.

Artificial intelligence tools can help make global classrooms available to all including those who speak different languages or who might have visual or hearing impairments. Presentation Translator is a free plug-in for PowerPoint that creates subtitles in real time for what the teacher is saying. This also opens up possibilities for students who might not be able to attend school due to illness or who require learning at a different level or on a particular subject that isn't available in their own school. An educator spends a tremendous amount of time grading homework and tests. AI can step in and make quick work out of these tasks while at the same time offering recommendations for how to close the gaps in learning. Although machines can already grade multiple-choice tests, they are very close to being able to assess written responses as well. As AI steps in to automate admin tasks, it opens up more time for teachers to spend with each student. There is much potential for AI to create more efficient enrollment and admissions processes. Tutoring and studying programs are becoming more advanced thanks to artificial intelligence, and soon they will be more available and able to respond to a range of learning styles.

There are many more AI applications for education that are being developed including AI mentors for learners, further development of smart content and a new method of personal development for educators through virtual global conferences. Education might be a bit slower to the adoption of artificial intelligence and machine learning, But the changes are beginning and will continue. So, AI is the emerging technology that might take the education in a whole different level for both the learners and theeducators.

Gamification:

They say learning by playing is the best way to understand a complex concept. This applies true to all the students. When a complex concept is taught in the form of games, it sets the foundation right.

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Gamification is the process of using game elements in a non-game context. It has many advantages over traditional learning approaches, including:

- Increasing learner motivation levels
- Improving knowledge retention
- Better learner engagement through social mechanisms like badges, points, or leaderboards

In our modern world, technology is naturally a driving force behind learning and the development of curricula. To achieve better results from learners, today's educators are increasingly utilizing cutting-edge digital tools and strategies in their teaching methods. Gamification for learning is one of these strategies used increasingly by teachers around the world. Using gamified elements can positively impact student engagement and collaboration, allowing them to learn more efficiently as a result.

Gamification is about applying gaming strategies to improve learning and make it more engaging for individuals. Gamification for learning can be beneficial because games instill lifelong skills such as problem-solving, critical thinking, social awareness, cooperation, and collaboration. Games also motivate individuals, increase interest in certain subjects, reduce the rate of attrition among learners, improve grades, and enhance their cognitive abilities.

The global gamification market's estimated CAGR growth is 30%, around $31 billion, between 2020 and 2025 compared to 2019.

Gamification is the most suitable educational technology trend to turn learning into a more fun and engaging process. There is no reason for students not to be actively involved in classroom games. Students can learn and practice while they are joining in on exciting game activities. Gaming elementshelp create a funny and positive learning environment for learners.

The adoption of gamification is most popular in the K-12 education sector. It is because kids are quickly engaged in gaming videos or getting higher scores in a game. However, it does not mean that higher education or corporate training does not need fun elements to improve the engagement level of learners.

Blockchain Technology:

The Distributed Ledger Technology (DLT) from blockchain brings so many benefits to education, especially data storage.

Every time new data is added, it adds another "block" to the system, so the storage is technically limitless. Simultaneously, the data will be encrypted and distributed across multiple computers in the system. It makes transacting data decentralized and transparent.

Blockchain technology is used in Massive Open Online Courses (MOOCs) and ePortfolios to verify skills and knowledge. The DLT systems will answer the problems of authentication, scale, and cost foreLearning agencies. Moreover, it can help student applicants publish their accomplishments during thejob-seeking phase.

Blockchain's immutable ledger technology is ideal for storing academic data and records. But educators have also found the technology helpful for creating smart contracts, distributing student loan payments and sharing crypto incentives. These processes increase accountability, transparency and engagement inthe edtech sector.

The most important dimension of using blockchain is that it helps to overcome the stumbling block of many quality open educational resources that are hard to find on the web. To date, there is still no efficient

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method of disseminating open educational resources that offer maximum accessibility.
Blockchain can effectively support accessibility to open educational resources in publicly available and distributed global knowledge databases.

Learning Analytics:

The current landscape of learning analytics has dramatically expanded, especially for higher education. Learning analytics allows educators to measure and report student learning just by the web. From that, itis possible for them to better understand and optimize learning.
When teachers read insights from students' learning processes, they can improve the knowledge and skill acquisition of their students accordingly. For instance, teachers are able to see what type of information (text, images, infographics, or videos) that students enjoy most and use it more in their following lessons.Also, teachers are able to notice what pieces of knowledge weren't effectively delivered and enhance them next time. Moreover, learning analytics helps educators identify blocks of students who may have academic or behavioral challenges. From that, teachers could develop a way to help students reach theirfull potential.

e-Learning:

Distance learning became the top 2020 educational technology trend overnight because of the rapid spread of COVID-19 and school closures. This led to a rising demand for online educational platforms. eLearning is education or training delivered electronically. It can be slide-based online activities, or it canalso be an online course that helps business train employees in necessary skills.
With eLearning, educational content is delivered to learners through computers, laptops, tablets, or smartphones. Not only saving time but opening many doors for interactive learning. Rather than being in a passive experience, learners can choose what they need to learn quickly and easily, wherever they are. They also learn through interacting directly with on-screen information through, for instance, dragging content from one place to the next. Moreover, the decision-making scenarios in eLearning also encouragelearners to make their own choices on what they will learn next.

In e-Learning, learners just soak in knowledge through reading or viewing content, it changes the way education is delivered. Also, many eLearning courses include animation, podcasts, and videos that createa multimodal and practical learning experience.
Although eLearning has been around for a long time, it is staying green and continuously developing. Educators are using the advantages of technology to make learning more effective. That is why more and more online and blended learning courses are produced nowadays. Variety is the outstanding feature of online learning platforms. You can teach your students in real time (synchronous) via live stream or groupmeetings using Zoom or Microsoft Teams, or you can use recorded (asynchronous) methodologies with a wide range of media and digital functions available to enrich lessons. A good online learning platform canalso be combined with a Learning Management System (LMS) so you can keep track of your students' learning outcomes.

Podcasts:

Podcasts can enhance the personal connection felt between teacher and student. In research on educational podcasting, students indicate that they feel they have a one on one relationship with their teacher when listening to a podcast. Sometimes the connection feels even more personal than in a lecture class. This connection is especially relevant for distance learners, but also for your on-campus students, sometimes

missing the personal connection in a lecture hall setting.

The medium is also appealing to students for their flexibility. Instead of having to process all the information during a lecture, students can gain ownership of their learning experience by (re)listening to a podcast anywhere they want. Even though a lot of students prefer to listen at home, podcasts are accessible anywhere through streaming or even offline, as with the small file-size they can be quicklydownloaded to your phone.

CONCLUSION

The timing has never been better for using technology to enable and improve learning at all levels, in all places, and for people of all backgrounds. From the modernization of E-rate to the proliferation and adoption of openly licensed educational resources, the key pieces necessary to realize best the transformations made possible by technology in education are in place.

Educators, policymakers, administrators, and teacher preparation and professional development programs now should embed these tools and resources into their practices. Working in collaboration with families, researchers, cultural institutions, and all other stakeholders, these groups can eliminate inefficiencies, reach beyond the walls of traditional classrooms, and form strong partnerships to support everywhere, all-the-time learning.

Although the presence of technology does not ensure equity and accessibility in learning, it has the power to lower barriers to both ways previously impossible. No matter their perceived abilities or geographic locations, all learners can access resources, experiences, planning tools, and information that can set them on a path to acquiring expertise unimaginable a generation ago.

All of this can work to augment the knowledge, skills, and competencies of educators. Tools and data systems can be integrated seamlessly to provide information on student learning progress beyond the static and dated scores of traditional assessments. Learning dashboards and collaboration and communication tools can help connect teachers and families with instantaneous ease. This all is made more likely with the guidance of strong vision and leadership at all levels from teacher-leaders to school, district, and state administrators. For these roles, too, technology allows greater communication, resource sharing, and improved practice so that the vision is owned by all and dedicated to helping every individual in the system improve learning for students.
It is a time of great possibility and progress for the use of technology to support learning.

Innovation theory in education is a new field of scientific pedagogic knowledge; it is a paradigm ofinseparable unity and interconnection of the three main pedagogic processes in the field of education: *creation of novelties, their mastering and application*. In other words, the subject of innovation theory is the studies of integration of development, mastering and integration of novelties. Innovation theory in education is an innovative process in the educational system, innovative activity, novelty and innovative environment, in which the innovative processes take place.

“To address current challenges and prepare for the future, we must explore and implement innovative designs and delivery of education.”

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