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Embracing Digitalization in Education

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ABSTRACT: In the rapidly evolving educational landscape, digitalization has emerged as a pivotal force shaping both pedagogical approaches and student engagement. This manuscript explores the transformative impact of digital technologies on contemporary education, emphasizing the dual role these technologies play in both enhancing and challenging traditional learning environments. By analyzing the integration of Information and Communication Technologies (ICT) in classrooms, this paper highlights how digital tools can be leveraged to foster interactive and student-centered learning. It also addresses the complexities associated with shortened attention spans and the need for adaptive instructional strategies. Furthermore, the manuscript delves into the potential of emerging technologies, such as Augmented Reality (AR) and gamification, in revolutionizing educational practices, thereby creating immersive and engaging learning experiences. The findings underscore the importance of educators adopting a proactive stance towards digitalization, ensuring that both students and teachers are equipped to navigate and thrive in this digital era.

KEYWORDS: digitalization, educational technology, ICT, augmented reality, gamification, student engagement, pedagogy.

1 INTRODUCTION

It is with no doubt that today's learning conditions are far different than before. Some students, day after day, are getting shorter and shorter attention spans due to the unconditioned use of social media short videos and reels [1]. This uncontrollable, nearly- automated behavior has left students, among other social media users, with a short attention span and unable to focus for extended periods. On the brighter side, educators are now using the same techniques and psychological tricks to utilize and harness learners' engagement. Energizing students and adopting the methods mentioned earlier and pedagogical tools while relying on sensory stimulating content gives students a huge sense of involvement, leading to a better learning experience [1].

While digitalization could be viewed as a form of distraction in some form or shape, it has been found that classroom and educational institutions that do not allow digital devices lack several features that their counterparts are enjoying [1].

> "Environments that do not allow students to access and use digital devices can make the learning process disconcerting."

Practicing self-control while using digital technologies in education is one of the 21st-century skills that learners should develop. Furthermore, embracing technology by the educational institution Serves as a role model and Is viewed highly positively by the social learning theory.

The challenge in embracing new technologies has been and will always be in creating and calling for interactivity on the part of students. It is also important for learners to quickly adapt to technological tools and prepare for a lifelong learning journey [1].

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Students are only one aspect in the equation of new technologies in education, while educators are another important aspect. It is also important to talk about incentives when talking about technology use. The common conduct is to offer faculty members and professors incentives and rewards to value their time and effort towards the training and workshops they attend. Incentives could be in the form of direct compensation or recognition and promotion. All this is done to serve students better and achieve targeted educational outcomes [1].

2 APPLICATION OF ICT IN EDUCATION

The current unprecedented technological advancement in education has unlocked new frontiers for teachers who look to modernize, automate, and incorporate new and trending technological tools into the classroom environment. The shift in thinking has allowed for greater creative solutions that serve all active parties in the education sector, be it students, teachers, administrators, lawmakers, and shareholders [2]. Now, more than ever, teachers and students alike can expand their knowledge through online learning. Furthermore, with the use of PowerPoint slides and visual aids support, it has become easy to ignite conversations, while videos and animated motion could provide solutions for contextual, theoretical, or just conceptual issues that need to take one form to be fully understood by the learners [2].

On the one hand, learning for students starts from being assigned a topic to present on, this whole journey of understanding a topic, reading about it, and finding reliable and authentic resources to cite and utilize for the presentation. This journey of commitment and actively engaging in an activity mostly leads to a successful self-formation experience among students. On the other hand, it is very important for students to independently search for new knowledge when online or distance classes are taking place; these classes teach self-education, which should be taught to all learners from all age groups [2].

Virtual tutoring platforms are also expanding with the growing trend of online learning. Unlike formal education, virtual tutoring falls into the informal education segment. So, teachers post learning and supporting materials on the platforms used for private tutoring. However, Measuring and monitoring knowledge could Be similar to measuring knowledge in face-to-face classes while relying on technology in education. Using multimedia presentations, training, and control tests [2].

While it is hard to have learners study at their own pace in the classroom, it is possible to achieve it with extracurricular activities and assignments where students can choose the pace and intensity with which they want their learning to progress. Furthermore, studies show that online and distance extracurricular activities expand the learners' creativity and encourage students to learn more seriously about topics such as sciences, economics, arts, and humanities [2].

3 DIGITALIZATION AND LANGUAGE LEARNING

One of language learning's peculiarities is that it demands the use of three R's: reading, writing, and arithmetic. While not all start with R, they are particularly useful in language learning. Nowadays, people talk about the four C's: critical thinking, creativity, communication, and collaboration (Burbules et al., 2020). The previously mentioned 21st-century skills mark a change in educational aims and objectives. They are useful in educating learners about learning and adapting to a quickly changing world.

The previously mentioned C's could also be applied to how learners interact with digital media in education. For that, there are four basic stages [3]:

- Critically analyze the credibility of the information at hand.
- Interaction with various digital media productions to gain familiarity and become a digital native.
- Gain and develop literacy and fluency through engaging with different kinds of platforms.
- Finally, practice sharing and collaboration in social media and other applications.

All these stages have the same preliminary source of learning; they all share the concept of visual gratification among students. These sensory-rich learning environments constitute their own space. While it is important to serve students' immediate visual needs for a fostered learning experience, it is also undeniable that young learners need to be educated about the dangers of social media as a source of information for many of them [3].

For changes in educational ecology, many teachers claim that online teaching boosts their creativity, calling for a revolutionized and reformed form of education different from the traditional classroom. MOOCs, for example, have proven to be efficient even if developed with the intent of being simply an online "Delivery system"; yet, they come with a traditional form and content. Furthermore, ubiquitous learning (learning anytime and anywhere) is also prevalent to this day, and it could take the shape of [3]:

"Online, blended, visualization, virtualization, and augmented reality can play a role in how distributed and ubiquitous learning opportunities can be made available in formal education: learning at home, the workplace, the museum, the coffee house, the park, or city street. Learning can become more contextual, context-bound and situated in real life problems or questions which suggests, in turn, different reasons for learning and a more organic relationship of learning to other needs and interests."

Another trend with limitless potential in education is Adaptive instruction (also known as "intelligent tutoring") is also another trend. These adaptive learning system platforms aim to collect huge amounts of data points through learners' interaction with the instructional program. The collection of answers from hundreds of thousands of learners helps educators and education experts find patterns highlighting conceptual errors made by learners, which are then met by customized interventions tailored to each learner's need [3].

4 THE USE OF AR IN EDUCATION: USE CASES

Augmented reality (AR) has shown great potential in the past few years as a source for disruptive education in the fields of science, technology, Engineering, Arts, and mathematics. In a limited number of students' study, it has been found that using AR has made learning enjoyable and enhanced the whole learning experience (Toda et al., 2019). Using AR immersed students fully in the learning experience while it served as a stimulus for developing new skills, including team management skills, student-instructor interaction skills, and the required skills for engineering a working prototype of a word game. Henceforth, it has been argued that combining AR with language learning, relying on an active learning format, has provided students and instructors with a holistic and engaging education [4]. AR is the bridge between reality and virtual objects. It provides a link between the real world and the virtual one. AR provides a real-time direct view of the physical world with AR enhancements and virtual information. While AR offers a portal to the invisible digital world, it also provides students with a deeper learning opportunity, offers an effective and unique learning experience, and finally, AR allows for a meta-cognitive and student immersion with the tools and learning materials, and thus grants the perfect learning space, where collaboration, teamwork, and interaction are highlighted [4].

On the one hand, AR plays a major role in allowing learners to work on rather abstract and intangible concepts all while [4]:

> "Fostering student attention, increase content understanding and long-term memory retention, increase student motivation, improve collaboration, and generate a positive attitude."

On the other hand, integrating Augmented Reality has been shown to enhance students' academic performance, foster long-term retaining of concepts (enhanced memory), and promote a deeper understanding and analysis of problem scenarios among students.

5 AR USE CASES [4]

- Vocabulary Enhancement: AR solutions display digital objects on top of real-world objects. Students could use their smartphones to scan AR-enabled codes, see virtual objects, and instantly unravel new vocabulary. This instant visual representation instantly links vocabulary with real-world objects, which makes the acquisition a walk in the park, especially for visual learners.
- Cultural Exploration: AR can allow students to travel through time and place and visit different countries and cultures across various periods. This service could be activated by scanning AR-enabled images, and then students gain access to services such as 360-degree tours, maps, and animated presentations while practicing language skills.
- Language Gamification: AR can shift language learning and add interactivity and challenges. The process of adding gamification to language learning motivates students and promotes active participation in the classroom.

6 GAMIFYING EDUCATION

6.1 GAMIFYING EDUCATION

Gamifying education is trending due to young learners' appreciation for games and competition. This concept uses notions from video games, such as competition and games' mechanics and design elements in education. This concept first became

famous with the growth of the video games industry. The concept of gamification also relies on storytelling to circulate ideas in the classroom; stories connect ideas while motivating learners to compete and thrive in a learning environment. This makes the classroom homogenous and forms learning communities that come together to learn while participating in games [5].

Gamification elements are many, but the most important ones are as follows [5]:

- Points system: The points system helps build motivation among students while tracking each student's progress and increases engagement.
- Leaderboard: the points system goes hand in hand with the Leaderboard; it helps build teamwork spirit and a friendly competitive environment.
- Surprise element: Surprises add a magical yet fun element to the learning experience. It rallies students towards an unexpected reward. Surprises also channel enthusiasm among learners and boost classroom performance.
- Quizzes: Quizzes' role in a gamified learning experience is to promote brainstorming skills among learners, build confidence and self-esteem among learners, and evaluate knowledge in a summative manner.
- Challenges: Challenges among learners call for critical thinking to solve complex and complicated questions, build habits, and develop persistence and perseverance.

The gamification of education increases classroom performance among learners, classroom engagement, and internal/external motivation. While it is challenging to implement a gamified experience, gamification remains a plausible solution for students to learn quickly, have augmented knowledge retention, and enjoy the learning experience. All in all, gamification is positively viewed by educators and learners alike and is gaining acceptance and followers day after day [5].

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