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DIGITAL TECHNOLOGIES USED IN E–LEARNING

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ABSTRACT

This article aims to explore various technologies utilized in the delivery of e-learning. E-learning provides learners with the opportunity to pursue their education in a manner that is both convenient and accessible. It is a highly flexible and self-directed approach to learning, enabling individuals to engage with educational content at their own pace. As a globally accessible platform, e-learning also serves as a powerful motivator for adult learners. The drive to learn may stem from a desire for recognition, enhanced self-esteem, innate curiosity, or the pursuit of self-confidence and personal growth—each of which reflects the fundamental essence of learning.

Keywords. E-learning, digital technologies, online education, virtual learning, educational software.

INTRODUCTION

E-learning is transforming higher education through the use of disruptive technologies [8]. This teaching modality has become increasingly important in recent decades [9]. It has been a differentiating tool for many universities because it focuses on the student, has interactive methods based on technology, and allows students to access information more easily [10]. E-learning allows synchronous or asynchronous learning, anywhere, just by having access to the internet [11. E-learning is rapidly emerging as a widely adopted mode of education in India. Technological advancement has been a key factor driving the growth and acceptance of e-learning across the country. In essence, e-learning refers to the utilization of technology to deliver educational content that enhances knowledge acquisition and performance. Over the past two decades, India has witnessed significant progress in the field of technology, which has laid a strong foundation for the expansion of digital education [3].

E-learning is a broad term that encompasses various forms of educational technologies designed to electronically support both teaching and learning processes. It serves as a technological channel for the dissemination, development, and exchange of knowledge, and it often complements traditional educational practices. This method of education includes diverse components such as multimedia-based learning, technology-enhanced instruction, and computer-supported training.

Some commonly associated terms include computer-based instruction (CBI), computer-assisted instruction (CAI), internet-based training, web-based learning, online education, and virtual learning environments (VLEs). Each term highlights specific features, tools, or modes of delivery within the e-learning domain.

E-learning can be delivered through various media formats, including text, audio, images, animation, and streaming video. Additionally, it involves the use of technological tools and platforms such as audio or video recordings, satellite broadcasting, CD-ROMs, and computer-based programs. This paper discusses the key technologies that enable and support the delivery of e-learning in contemporary educational settings [5].

Literature Review and methods

To develop this study, a Systematic Literature Review (SLR) was carried out, through the research of articles in international databases, reading and evaluating the relevance or lack of relevance of the study, and conducting a bibliometric analysis of the chosen terms. Digital databases are designed to facilitate access when searching for information. These allow for speed and updated information in the search process of the research [12]. The development of this article is structured into 8 steps, as shown in Figure 1.

According to Garrison and Anderson (2003), the Community of Inquiry (CoI) framework emphasizes the importance of cognitive, social, and teaching presence in digital learning environments. Technologies like Learning Management Systems (LMS) facilitate this triad by organizing instructional materials, enabling communication, and assessing learner performance [13].

Mayer (2009) found that multimedia learning, which integrates text, images, and audio-visual content, significantly enhances comprehension and retention. Modern LMSs and e-learning platforms leverage this principle by offering interactive content that appeals to different learning styles [14].

Holmes et al. (2019) explored the application of Artificial Intelligence (AI) in personalized education, noting that AI can adapt learning paths based on individual performance and preferences, providing immediate feedback and support [15].

In this study, an analytical-methodological approach was employed to investigate the role and significance of digital technologies in the delivery and development of e-learning. The research was conducted through a systematic review and content analysis of existing scientific and practical literature.

A total of 11 peer-reviewed articles were selected for in-depth analysis. These articles were chosen based on their relevance to the topic of digital educational technologies, particularly in the context of e-learning.

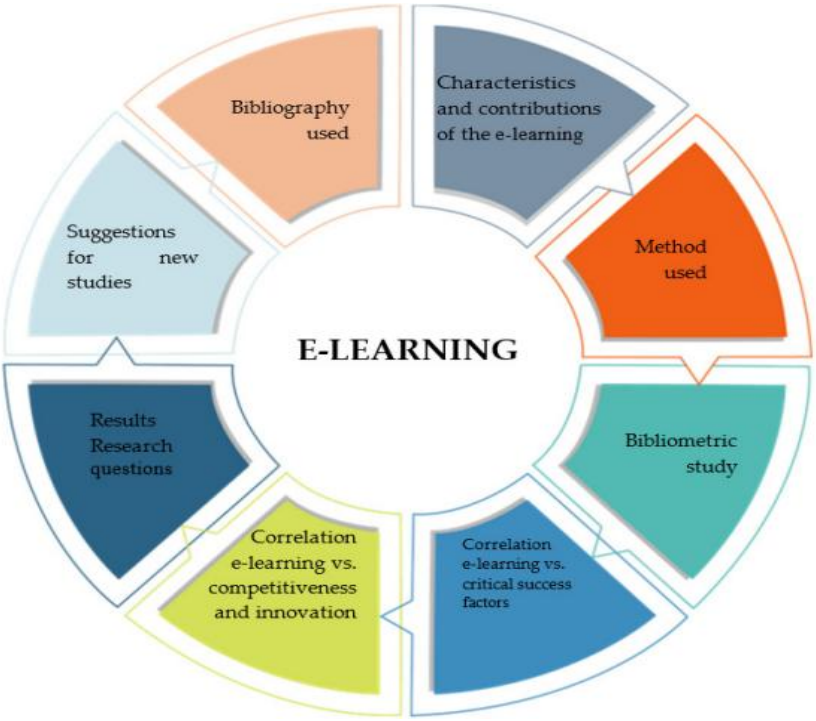

Fig 1. https://www.mdpi.com/2227-7102/13/6/619 [7].

RESULTS AND DISCUSSION

Given the broad answer to the question “what is elearning," educational scientists have identified different types and paradigms of elearning, according to categories such as learning style, delivery method, educational tools, and online course platforms used. The rise of digital technologies has profoundly transformed the education sector, particularly in the realm of e-learning. These advancements have made education more accessible, flexible, and personalized. A deeper look into the various digital technologies used in e-learning reveals the vast potential they hold for enhancing the learning process, as well as and opportunities. The following are the types of e-learning used today.

Technology used for the methods of e-learning is as below

Screencasting: A screencast is a digital recording of computer screen output, also known as a video screen capture, often containing audio narration. The term screencast compares with the related term screenshot; whereas screenshot generates a single picture of a computer screen, a screencast is essentially a movie of the changes over time that a user sees on a computer screen, enhanced with audio narration. Screencasts can help demonstrate and teach. Educators may also use screencasts as another means of integrating technology into the curriculum.Students can record video and audio as they demonstrate the proper procedure to solve a problem on an interactive whiteboard. This method allows users to share their screens directly from their browser and make the video available online so that the viewers can stream the video directly.

Multimedia Tools. Videos, audio recordings, animations, interactive simulations, and infographics are used to enhance understanding and maintain student engagement. These tools align with Mayer’s principles of multimedia learning to improve knowledge retention [14].

Virtual Classrooms. Platforms like Zoom, Microsoft Teams, and Google Meet enable live interaction between teachers and students, replicating the face-to-face learning experience with features like screen sharing, breakout rooms, and recording [16].

Mobile Learning Applications. Apps such as Duolingo, Khan Academy, and Quizlet allow learners to study on-the-go. These mobile tools support flexible, self-paced learning and are especially useful for informal education [17].

Gamification Tools. Tools like Kahoot!, Quizizz, and Classcraft incorporate game-based elements such as points, levels, and badges to increase motivation and make learning more interactive [18].

Cloud Storage and Collaboration Tools. Google Drive, OneDrive, and Dropbox facilitate the sharing of materials and collaborative work among students and teachers, promoting peer learning and group tasks [19].

Virtual Reality (VR) and Augmented Reality (AR). These immersive technologies (e.g., Google Expeditions, Oculus for Education) are increasingly used for experiential learning, especially in subjects like science, medicine, and engineering [20].

Assessment and Feedback Tools. Online testing tools like Socrative, Edmodo, and Google Forms support formative and summative assessments, enabling instant feedback and performance analysis [21].

Webcams. Webcams are integral tools in e-learning environments, primarily used to enable real-time video communication between instructors and learners. They facilitate face-to-face interaction in virtual classrooms, which enhances engagement, accountability, and communication [22].

Blogging. Blogging is an educational technology tool that allows learners and educators to create, share, and reflect on content in a public or private digital space. Blogs can be used as online journals, learning diaries, or collaborative platforms to enhance writing skills, critical thinking, and digital literacy [23].

CONCLUSION

Digital technologies have revolutionized the landscape of education, especially in the realm of e-learning. The integration of advanced tools such as Learning Management Systems (LMS), virtual classrooms, mobile learning apps, and educational software has enhanced accessibility, flexibility, and engagement for learners worldwide. These technologies provide a dynamic learning environment, enabling personalized learning experiences, real-time collaboration, and the ability to scale education globally. Moreover, digital technologies promote collaborative learning, providing students with opportunities to engage in discussions, share resources, and participate in online communities. The integration of multimedia elements, including video, simulations, and interactive activities, further enhances the learning experience, making it more engaging and effective.

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