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The future of E-LEARNING: How technology is transforming education in the 21st century

The case of third year LMD Students at UKMO

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Dedication

To my dearest parents, whose love and sacrifice have been the cornerstone of my existence, I dedicate my deepest gratitude and boundless admiration. To my treasured brothers and sisters, Lotfi and Ibtissem, your presence in my life is a constant source of joy and strength. Lotfi, with your infectious laughter and unwavering support, you light up every room and fill our hearts with warmth. Ibtissem, your kindness and wisdom guide us through life's challenges, reminding us of the importance of compassion and resilience. And to my dear friends Marwa and Soumia, whose friendship has stood the test of time, your unwavering loyalty and shared laughter have been a source of comfort and joy. Together, you all form the tapestry of my life, weaving love, support, and laughter into every moment. I am endlessly grateful for the blessing of your presence in my life

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Abstract

This dissertation explores the transformative impact of technology on education in the 21st century, focusing on e-learning. Through an analysis of e-learning types and definitions within the realm of educational technology, the study examines how technology has reshaped teaching and learning practices. The dissertation investigates the evolution of e-learning and its various forms, including asynchronous online courses, synchronous virtual classrooms, and blended learning approaches. It assesses how technology has democratized access to education, enhanced learner engagement, and enabled personalized learning experiences. Furthermore, the study explores the role of emerging technologies such as artificial intelligence, virtual reality, and adaptive learning systems in revolutionizing education. It discusses the challenges and opportunities associated with integrating technology into education, including digital equity and teacher professional development. This dissertation envisions a future where e-learning continues to evolve, offering learners diverse educational opportunities. By highlighting the transformative potential of technology in education, the study aims to inform educational stakeholders about the possibilities and challenges of e-learning in the digital age.

List of Abbreviation

LMD: Licence Master Doctorate

BL: Blended learning

FTF: Face to face

AI: Artificial intelligence

VR: Virtual reality

AR: Augmented reality

LMS: Learning Management System

ICT: Information and Communication Technology

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General Introduction

INTRODUCTION

In our rapidly advancing world, education is undergoing a significant transformation, and at the heart of this evolution is E-learning which is considered as an online learning technique. This exploration takes us on a journey into the future of education, unveiling how e-learning is reshaping traditional learning methods, making them more accessible and adaptable to our changing times. As we step into the 21st century, the once-familiar landscape of education is being redefined by technology, and e-learning that play a starring role in this revolution. Gone are the days when learning was confined to physical classrooms and rigid schedules. e-learning brings education to your fingertips, breaking down barriers and offering a flexible approach to learning that fits seamlessly into our dynamic lives. The essence of e-learning lies in its simplicity and accessibility. No longer restricted by geographical boundaries, learners from around the world can access a wealth of knowledge with just a click. whether it is online courses, interactive videos, or collaborative platforms, e-learning empowers individuals to tailor their learning experiences, fostering a sense of independence and self-directed exploration. Moreover, the rise of E-learning introduces us to a diverse range of technological tools that enhance the educational experience. Artificial Intelligence, virtual classrooms, and interactive simulations are becoming integral components of the modern learning environment. These tools do not just make learning more engaging; they open up new possibilities for personalized learning, catering to individual preferences and promoting critical thinking skills essential for success in the 21st century.

Statement of the Problem

In today's learning schools, using computers and the internet (E-learning) is becoming more common. But this brings some challenges. We need to figure out how everyone, no matter where they live or how, can use these digital tools for learning. We also want to understand if learning online is as good as learning in a traditional classroom. Another challenge is making sure that teachers and students know how to use these digital tools well. We also need to find the best ways to check how well students are doing in online classes. Solving these challenges will help make sure that E-learning is useful for everyone in the 21st century.

Research Questions:

The study endeavors to find answers to the following research questions:

- *What digital skills do students gain from academic field programs, and how do these skills effect their E-learning success*
- *How does better technology training for teachers and students impact the effectiveness of E-learning*
- *What are the benefits of academic field support in integrating technology into teaching and learning*
- *How do students and teachers perceive the use of educational technology in developing the future of E-learning*

Hypothesis:

It has been hypothesis that if academic field help teachers and students get better at using E-learning to acquire knowledge, we believe it may lead to positive outcomes in transforming education. By improving digital skills and making sure everyone can use technology well, we expect that E-learning to be more effective for everyone involved.

Significance of the study:

The importance of this study lies in its ability to make education better for everyone. By focusing on E-learning, it aims to ensure that everyone has a fair opportunity to learn. The study also seeks techniques to help teachers teach more effectively, improve everyone's computer skills, and provide guidance for better education rules. In essence, the study's significance is in its mission to make E-learning fair, effective, and more accessible for everyone in the 21st century.

Aims of the Study:

The aim of this study is to investigate and understand the effect of E-learning on transforming education in the 21ST century. It seeks to explore how E-learning can be made more accessible, effective, and beneficial for both educators and learners. The study aims to provide insights into improving E-learning techniques to create a more inclusive and responsive E-learning environment. Ultimately, the goal is to contribute

valuable knowledge that can enhance the overall quality and accessibility of education in the digital age.

Research Methodology Design and Tools:

Samples of the Study

In this study we choose a sample composed of thirty (30) Third year LMD (instrumentation) students registered for the academic year 2023/2024 at the department of Electronics and Communication at the University of Kasdi- Merbah – Ouargla, the reason behind choosing those participants because they studied during the coronavirus pandemic, education was conducted online and through distance learning using platforms such as Zoom and Moodle.

Means of the study

For collecting data, we have used a questioner consisting of fifteen questions divided into three sections. The first section is about background information, the second is about the future of e-learning, and the last section is about educational technology.

Structure of the study

This dissertation is divided into two parts, a theoretical part, and a practical part. The theoretical part consists of two chapters, the first chapter deals with the historical evolution of e-learning, its definition, types, advantages and disadvantages, the relation between technology and e-learning, and its strategies. The second chapter deals with the historical evolution of education, its definition, types, educational technology, types of educational technology and the importance of technology in education. The second part tackles the practical side, and it consists of one chapter (chapter three) that deals with the analysis of data collected.

CHAPTER-1. The future of E-learning in the 21ST century

Introduction

Step into a realm where education knows no bounds of traditional classrooms. Imagine learning at your own pace, whether lounging on your couch or amidst the buzz of a coffee shop. Welcome to the world of e-learning – a vibrant, ever-evolving approach to education fueled by technology. E-learning, synonymous with online or digital learning, encompasses a broad spectrum of electronically delivered educational methods. It transcends mere digitization of textbooks, harnessing technology to create immersive simulations, collaborative environments, and personalized learning pathways. For students thirsting for knowledge, professionals seeking to enhance their skills, or educators aiming to broaden their reach, e-learning holds promise. Join us as we navigate the myriad benefits of e-learning, from enhanced flexibility to tailored learning experiences. Explore diverse platforms and strategies that make learning engaging and effective. Embrace a journey where education breaks free from temporal and spatial confines, ushering in a realm of personalized, empowering learning experiences for all.

1.1. Historical evolution of E-learning

As the origin of the word e-Learning is not certain; it is proposed that the term probably originated during 1980 (Moore, et al, 2011). The concept of e-learning emerged in the early 1980s with the advancement of modern technologies facilitating rapid transmission of multimedia messages, research, and studies. However, its comprehension primarily revolves around two levels: firstly, acquainting oneself with the operation of contemporary electronic devices and harnessing their capacity for information reception, transmission, storage, and manipulation; secondly, engaging in structured educational modules delivered by academic institutions, typically culminating in the attainment of a specialized academic certification upon fulfilling requisite prerequisites. The initial level of e-learning adoption pertains to proficiency in utilizing

electronic devices and understanding their software, systems, and functionalities, which constitutes a fundamental barrier toward progressing to the more advanced second level of e-learning (Aboud & others, 2008, p. 278).

Itmazi (2010) observes that during the 1970s, international academic institutions began integrating television technology and video tapes into their educational paradigms. Subsequently, in the following decades, particularly the 1980s and 1990s, the proliferation of e-learning witnessed the establishment of four universities in Europe, while over twenty universities worldwide embraced e-learning methodologies. By the late 1980s, notable advancements in the e-learning domain were achieved, particularly in networked education, which harnessed compressed technology for educational video materials and utilized bidirectional optical fibers for seamless transmission of both video and audio content. Consequently, contemporary technological innovations facilitate enhanced pedagogical interactions between educators and learners, effectively transcending geographical barriers. Itmazi further delineated e-learning into three distinct generational phases (Itmazi, 2010, pp. 21-30).

In the initial phase of its development, ranging from the early 1980s to the mid-1990s, e-learning witnessed its first generation. Educational content and instructional resources were primarily distributed via CD-ROMs during this period. Interactions between learners and instructors were characterized by individual engagement, with a significant emphasis placed on the active participation and autonomy of the learner. Notably, this epoch predates the widespread integration of internet-based technologies within e-learning frameworks.

The second evolutionary stage of e-learning, according Gharib (2009), initiated in the 1980s and persisted until the onset of the new millennium in 2000, coinciding with the widespread adoption of internet technologies. This phase was characterized by notable advancements in instructional methodologies, educational strategies, and course content sophistication, surpassing the preceding generation. Unlike its antecedent, this era accentuated enhanced communication dynamics and interactive modalities, prioritizing collaborative engagement and teamwork within the educational framework (Ismail, 2009, p. 41).

According to Itmazi (2010), the inception of the third generation of e-learning transpired post-2001, concomitant with the technological revolution that burgeoned towards the conclusion of the 1990s. This epoch heralded a qualitative metamorphosis in educational content, characterized notably by the integration of multimedia elements such as digital imagery, presentations, and video files. Additionally, the advent of virtual environments and satellite-mediated communication marked distinctive hallmarks of this generation. These innovations collectively propelled the evolution and maturation of e-learning, culminating in its contemporary state characterized by the pervasive utilization of cutting-edge technologies for data exchange and information dissemination, alongside the cultivation of heightened interactivity between educators and learners throughout the educational process. The trajectory of scientific advancement persisted, ultimately giving rise to digital content, complemented by the development of tools engineered to optimize interaction, facilitate direct communication, and employ instantaneous messaging techniques.

The advent of educational electronic platforms, communication and messaging services, along with voice and animation technologies, heralded significant strides in the evolution of e-learning. These advancements catalyzed the proliferation of various appellations for this educational modality, including online education, distance education, virtual education, and the overarching term, e-learning. This paradigm of learning serves as a pivotal solution catering to the diverse educational needs of students worldwide, particularly those encumbered by manifold obstacles hindering their access to conventional educational pathways. Such impediments encompass geographical remoteness from educational institutions, prohibitive costs associated with travel and accommodation, vocational commitments incompatible with traditional study formats, linguistic barriers, and navigating the complexities of diverse socio-cultural contexts. (Anderson, T. 2008)

E-learning represents a sophisticated instructional methodology leveraging modern communication mechanisms facilitated by computer technology, networks, and multimedia resources. This encompasses a rich array of audio-visual elements, graphical interfaces, robust search functionalities, extensive electronic repositories, and internet-based portals. Whether deployed remotely or integrated within traditional

classroom environments, e-learning optimizes a diverse suite of technological tools to expedite the delivery of educational content to learners, thereby mitigating temporal and logistical constraints while maximizing pedagogical efficacy and learning outcomes.

1.2. Definition of E-Learning

E-learning is the delivery of a learning, training, or education program by electronic means (Li, Lau & Dharmendran, 2009). This form of remote education, conducted over the internet, encompasses the utilization of computer technology to enhance the learning process. Currently, the term eLearning serves as a broad descriptor for electronic learning, particularly prevalent in higher education settings where reliance on computer technology among university students is prominent.

E-learning, closely intertwined with Information and Communication Technology (ICT), embodies diverse methodologies aimed at leveraging technological tools for educational purposes. Clarke (2004) contends that e-learning encompasses various approaches unified by their reliance on ICT, as affirmed by Jones (2003), who posits that regardless of the terminology employed—be it "e-learning," "digital learning," or "computer-enhanced learning"—the fundamental objective remains the exploitation of web-based technology to enhance the learning experience. Consequently, online learning inherently operates within an ICT-based framework, with numerous higher education institutions employing ICT to develop, disseminate, and administer course materials, lectures, communication channels, research endeavors, and administrative services (Soong, 2012).The scope of e-learning, as delineated by the European e-Learning Action Plan, entails the utilization of multimedia technologies and the internet to enhance learning quality by facilitating access to resources, enabling remote collaboration, and fostering exchanges. Hence, it can be succinctly conceptualized as the provision of online access to learning materials anytime and anywhere (Holmes, 2006).

Furthermore, various synonyms are employed interchangeably to denote the overarching concept of e-learning, including computer-based learning, computer-assisted instruction, electronic learning, technology-enhanced learning, technology-based learning, web-based learning, internet-based learning, advanced distributed

learning, web-based instruction, online learning, network learning, and distance learning (Romiszowski, 2004;Khan, 2005). Agarwal, Deo, & Das (2004) delineate e-learning as the utilization of computers or electronic devices to disseminate educational materials and to manage data, information, and knowledge, with the overarching aim of enhancing student performance. This approach enables the delivery of interactive learning opportunities electronically, facilitating access to learning resources irrespective of location or time. An alternative definition proposed by the NCSA e-Learning group characterizes e-learning as the acquisition and utilization of knowledge primarily facilitated through electronic means, currently reliant on networks and computers but potentially evolving to incorporate diverse channels and technologies. E-learning encompasses various formats, including courses, modules, and smaller learning objects, and may involve synchronous or asynchronous access across geographical boundaries and time constraints.Wan, Wang, and Haggerty (2008) conceptualize e-learning as a virtual learning environment where learner interactions with materials, peers, and instructors are mediated through information and communication technologies. Elliot (2009) extends this definition to encompass the utilization of network technology to design, deliver, administer, and extend learning experiences.

Moreover, the American Society for Training and Development (ASTD) defines e-learning as a comprehensive amalgamation of processes and applications encompassing computer-based learning, web-based learning, virtual classrooms, and digital collaboration. These elements are predominantly delivered through internet, intranet, audiovisual mediums, satellite broadcast, interactive television, and CD-ROM.

Similarly, the Commission on Technology and Adult Learning (2001) elucidates e-learning as instructional content or learning experiences facilitated by electronic technology, incorporating diverse learning strategies and technologies ranging from CD-ROMs and computer-based instruction to videoconferencing, satellite-delivered learning, and virtual educational networks. Islam and Selim (2006) echo this sentiment, elucidating e-learning's multifaceted nature, which encompasses web-based learning, computer-based learning, virtual classrooms, digital collaboration, and various technological mediums such as internet, intranet, audiovisual tapes, internet or satellite television, and CD-ROMs. Rodrigues, Almeida, Figueiredo and Lopes (2019)

define e-learning as an inventive web-based platform founded on digital technologies, along with diverse educational materials. Its fundamental objective is to furnish students with a customized, learner-centric, accessible, engaging, and interactive learning atmosphere that bolsters and amplifies the learning endeavors (p. 95).

1.3. Types of E-Learning

E-learning, or electronic learning, encompasses various modalities and approaches aimed at delivering educational content and facilitating learning experiences through digital technologies. Within the realm of e-learning, several distinct types have emerged, each offering unique features and benefits tailored to different learning contexts and objectives:

1.3.1. Blended learning

Blended learning (BL) is defined by Bonk and Graham (2006) as a system that integrates face-to-face instruction with computer-mediated instruction. Similarly, Graham (2006) characterizes BL as a fusion of traditional face-to-face (FTF) learning and computer-mediated learning models. Smythe (2012) underscores BL as a blend of effective teaching and learning methods that necessitates practical application, leveraging computer technologies to facilitate learning and engage students. Thorne (2003) further elaborates, describing BL as an educational model integrating e-learning advancements with traditional teaching methods to enhance student interaction in the classroom. BL manifests in various forms. It may entail the use of PowerPoint slides during in-person lectures coupled with additional online homework assignments (Bates, 2016).He (2016) also introduces the concept of a "flipped" classroom within BL, where lectures are recorded and accessible online, with in-class time allocated for discussions and clarifications. Additionally, BL might encompass a comprehensive course redesign, with careful consideration given to online and in-person activities. Bates (2016) underscores the necessity for teaching redesign to facilitate students' predominantly online learning experiences, with in-person sessions reserved for specific activities that cannot be replicated online.

The Commonwealth of Learning (COL) (2015) defined blended learning (BL) as a pedagogical approach that integrates diverse methods, technologies, and resources to enhance student learning, with a particular emphasis on a student-centered approach that fosters autonomy and flexibility. They underscored that BL, hybrid learning, technology-enabled learning, technology-mediated instruction, web-enhanced instruction, and mixed-mode instruction are all synonymous terms referring to the same concept and strategy of learning, wherein two distinct styles of interaction are employed (Commonwealth of Learning, 2015; Bates, 2016)

1.3.2. Asynchronous E-Learning

Asynchronous e-learning entails an indirect mode of learning wherein the presence of both teacher and learners simultaneously is not required. It encompasses online learning scenarios where students independently engage with a set of course objectives by accessing designated online platforms and interact with peers and instructors over a time gap, utilizing e-learning tools like discussion forums, email, and bulletin boards (Oye, Salleh & Lahad, 2012; MB Younes & Al-Zoubi, 2016). Typically, students are allocated a timeframe within which to complete assigned tasks, rendering this form of e-learning self-paced and intermittent, granting learners autonomy over their learning journey (Snart, 2010). Hrastinski (2007) contends that asynchronous communication fosters cognitive engagement by facilitating enhanced reflection and the exchange of complex information.

The benefits of asynchronous e-learning include the flexibility for learners to study at their convenience irrespective of geographical constraints, and the ability to revisit course materials electronically as needed (Bani Younes & Al-Zoubi, 2016). According to Hrastinski (2008), this non-real-time learning model appeals to students as it accommodates their diverse commitments alongside their studies. However, there are drawbacks to this approach, such as the absence of immediate feedback from instructors, which may lead to learner frustration due to the isolated nature of their work (Bani Younes & Al-Zoubi, 2016).

1.3.3. Synchronous E-Learning

The synchronous mode of e-learning, also known as direct e-learning, operates on the premise that both students and instructors can engage in real-time online communication and discussions regardless of their physical locations. This approach closely mirrors traditional teaching methods, as instructors deliver content through verbal lectures and, occasionally, visual presentations via cameras (Clark & Mayer, 2003; Snart, 2010). Synchronous e-learning commonly utilizes a virtual classroom environment facilitated by electronic tools such as video conferencing, chat rooms, whiteboards, and audio conferencing, often integrated within learning management systems like Moodle (Rice, 2011).

Engagement in synchronous e-learning necessitates real-time online presence and robust technological infrastructure. Participants, whether students or teachers, are required to be in front of their computers to engage in discussions or receive lessons through virtual classrooms or chat rooms. This environment transcends the traditional classroom setting, delivering learning materials directly via the internet, enabling students to rely solely on technological means to access contemporary information. Some specialists contend that synchronous e-learning can also occur within physical classrooms through the integration of computer technology and internet resources under the supervision of teachers (Clark & Mayer, 2003; Snart, 2010). This mode of learning offers numerous advantages, including immediate feedback and live online interaction, enabling students to engage with instructors verbally during learning sessions. Additionally, synchronous e-learning is well-suited for large group settings where various sessions need to be broadcast simultaneously (Tiong & Sim, 2005). However, there are drawbacks to consider, such as the requirement for modern devices and a robust communication network. Moreover, the absence of direct interaction between teachers and students may potentially hinder the learning process. Consequently, direct e-learning is perceived as the most advanced and intricate form of e-learning, as it entails simultaneous online engagement between learners and instructors (Bani Younes & Al Zoubi, 2016).

1.3.4. Mobile Learning

Mobile learning has experienced a significant surge in adoption across various educational sectors, driven by the widespread popularity of mobile devices, which have revolutionized learning, communication, and lifestyles. Kukulska.H. et al. (2004) contend that mobile technology offers benefits such as quick feedback, immersive experiences, and situated learning in authentic contexts, thereby expanding learning opportunities without constraints that hinder the learning process. Despite its growing prominence, the concept of mobile learning remains elusive due to challenges in defining its unique nature. Scholars, including Kukulska-Hulme and Traxler, acknowledge the difficulty in providing an exact definition, as it encompasses diverse experiences, uses, and backgrounds (Sharples, 2006).

To elucidate the concept of mobile learning, scholars emphasize the notion of "mobility," as articulated by, Sharples (2006), and Traxler (2007), Kukulska-Hulme (2007, 2009) underscoring both spatial movement and the capacity for time-shifting and boundary-crossing. El-Hussein and Cronje (2010) delineate mobile learning across three key dimensions: mobility of technology, learning, and learners. Firstly, mobility of technology encompasses devices such as smartphones, tablets, and GPS-enabled devices, equipped with wireless connectivity, enabling learners to access content and instruction anywhere, anytime (El-Hussein and Cronje, 2010; Trinder, 2005). These technologies afford learners unrestricted access to diverse learning materials and functionalities, facilitating communication, organization, information retrieval, and entertainment.

Secondly, mobility of learning fosters new modes of educational delivery, characterized by personalization, learner-centeredness, situatedness, collaboration, ubiquity, and lifelong learning (Sharples, Taylor & Vavoula, 2005). Mobile devices empower learners to engage in personalized and unique learning experiences without constraints of age, time, or duration, enabling seamless connectivity for collaborative learning endeavors (Globeck, 2006). Learner's construct and reconstruct knowledge through social interaction, fostering active participation and motivation during the learning process.

Finally, mobile learning enhances the mobility of individual learners, enabling flexibility, accessibility, and personalization of learning activities (Heyoung & Yeonhee, 2012). Learners leverage mobile technologies to enhance productivity and effectiveness, cultivating a sense of individuality, community, and ubiquity, thereby fostering enjoyable and effective learning experiences.

1.4. Advantages and disadvantages of E-learning

1.4.1. Advantages of E-learning

Online learning is widely recognized as a significant and advantageous educational system that contributes to the educational advancement of nations by cultivating a new generation of educators and learners whose learning experiences transcend traditional classroom settings. Numerous scholars advocate for the implementation of online education at the tertiary level for various compelling reasons.

Firstly, online education effectively eliminates the time and location constraints inherent in traditional face-to-face classrooms (Serim, 2007). Learners, as Clarke (2004) contends, enjoy the freedom to select the most conducive "place, pace, and time" for their studies. Similarly, Lipshitz & Parsons (2008) underscore the flexibility, convenience, and ability to study at one's own pace at any time and location with internet access as key advantages of e-learning. Consequently, online courses offer learners the flexibility to determine when and where they engage in their studies, facilitating learning in diverse physical and virtual environments (OECD, 2001). Thus, convenience and flexibility emerge as primary benefits of e-learning, empowering users to learn at their preferred locations, be it at home, work, or while traveling, without being constrained by time and place. Furthermore, online courses remain accessible at all times, eliminating the need for physical attendance as long as the requisite equipment is available.

Furthermore, the self-paced nature of the learning process caters to both slow and quick learners, thereby reducing stress and enhancing satisfaction among learners. Additionally, online learning offers a self-directed approach, enabling users to select content, tools, and materials tailored to their individual interests, needs, and skill

levels, allowing them to align these resources with their preferred learning styles (Hall, 1997). Agarwal, Deo, & Das (2004) posit that e-learning harnesses the capabilities of computers and electronic devices to deliver educational materials, manage data, information, and knowledge, thereby enhancing students' performance through interactive communication with their instructors. Moreover, online learning fosters greater collaboration and interactivity, facilitated by technology tools that provide a more convenient and comfortable learning environment, conducive to collaborative learning projects. Furthermore, e-learning promotes learner engagement, encouraging active participation in the learning process and driving improved performance through training (Kruse, 2002). Alismail (2015) asserts that e-learning serves as a potent tool for learners to access information and acquire knowledge independently, thereby fostering independent learning. While educators bear the responsibility of guiding students in effective information research to develop their skills and learning strategies.

Similarly, Collis and Moonen (2001) assert that e-learning serves as a vital method to deliver essential information to learners through modern technology tools such as computers, the internet, multimedia, sound, images, graphics, search mechanisms, and electronic libraries, accessible via internet portals, thus optimizing time and effort for learners. However, it is important to note that traditional classroom learning will not be entirely supplanted by e-learning, as teachers and learners have a strong attachment to face-to-face classroom environments, where direct communication and interaction occur. Moreover, e-learning is instrumental for educators, facilitating the creation of educational applications and materials to compensate for the lack of experience among some learners.

Furthermore, e-learning enables learners to save conversations for later listening, adding to its flexibility by offering unlimited access to education. It also enables learners to connect with teachers or institutions worldwide, fostering cost and time savings as well as providing access to relevant videos and audio lectures from any location. Consequently, learners have numerous opportunities for knowledge enhancement (Salamat, Ahmad, Bakht, Saifi 2018).

Many scholars highlight additional benefits of e-learning, emphasizing its learner-centered approach, tailored instructions, and accessibility to educational content anytime, anywhere. E-learning is particularly advantageous in areas where formal educational institutions are scarce, ensuring accessibility regardless of geographical location. Moreover, the pace of progress in e-learning courses surpasses that of traditional classroom courses, as learners can skip familiar material to focus on areas requiring further understanding (adapted from Salamat, Ahmad, Bakht, Saifi 2018).

Additionally, online learning facilitates ongoing communication between teachers and learners, transcending physical boundaries and enabling interaction beyond official class hours. This offers learners ample opportunities to seek clarification, ask questions, and receive feedback on school courses at their convenience. Moreover, it can enhance privacy between students and teachers, providing a confidential space for students to address academic concerns without feeling self-conscious about their academic level in front of peers, thus enabling them to share their ideas with teachers privately to rectify errors and mistakes.

Online learning offers the advantage of easy and swift updates to remain current, as updated materials can be promptly uploaded to a server, eliminating the need for reprinting manuals and retraining instructors. Additionally, the integration of various multimedia elements such as videos, audios, quizzes, and interactions in e-learning may enhance learner retention and understanding of the topic. Furthermore, e-learning presents an accessible learning avenue for individuals with disabilities or health conditions that may impede their participation in institutionalized education.

Another notable feature of e-learning is its capacity to accommodate an unlimited number of students while maintaining the quality of content comparable to that offered to full-time students. Moreover, online learning fosters collaboration among students from diverse backgrounds, cultures, and geographic locations, potentially increasing student interest and motivation through exposure to a wide array of learning experiences facilitated by multimedia resources. Consequently, e-learning demonstrates flexibility in delivery media, course types, and access methods, catering to diverse learning styles unlike traditional classroom education.

Furthermore, online learning offers the advantage of facilitating various forms of interaction, including online, offline, and live interactions between students and teachers, as well as among students, thereby enhancing the joy and satisfaction derived from the learning process. This diverse range of interactions fosters self-directed learning and facilitates the improvement of technical and vocational skills (Dargham, Saeed, Mcheik, 2012; Behera, 2013).

1.4.2. Disadvantages of E-learning

Based on the preceding discussion, it is evident that e-learning is significantly beneficial and crucial for both teachers and learners. However, there are several potential drawbacks associated with e-learning. According to Asaqli (2020), e-learning can diminish social and cultural interactions, impede communication mechanisms such as body language, eliminate peer-to-peer learning, and lead to issues of impersonality. Since e-learning allows students to learn without being physically present in a classroom, it can be challenging for learners to establish social connections. Moreover, the sense of isolation and separation from the social environment can exacerbate feelings of frustration. Indeed, the lack of human interaction and a sense of belonging can negatively impact intellectual and social development and success.

Some researchers argue that while traditional academic education promotes dialogue between teachers and students, this interaction is absent in the online learning environment. Additionally, the traditional academic experience, which includes face-to-face interactions with teachers and fellow students on campus, as well as time spent in campus libraries, offers a unique learning experience. This experience is fundamentally different from the one created through online learning at home.

Another drawback of e-learning is the limitation it imposes on student assessments, which are crucial for evaluating their progress. With the proliferation of online courses, current assessment methods primarily rely on "closed" exams (such as multiple-choice tests), assignments, and various text analysis software to evaluate "open" questions. However, the reliability of these tools remains contentious. Additionally, Asaqli (2020) points out that e-learning can cause learners to experience "cognitive

load" or cognitive burden. The online environment's use of multimedia elements, such as animations, video clips, and audio files, along with the rapid transitions between these different media types within a single lesson, can lead to increased attention and interest but also cognitive overload. Moreover, some teachers have not adapted their pedagogical approaches to suit online learning. Many still rely on traditional methods because they lack sufficient experience with the active teaching-learning techniques required for effective online instruction. As previously mentioned, the limited methods of assessment make it easier for students to cheat during unsupervised tests.

According to Kruse (2004), some experts argue that inappropriate e-learning content can lead to the acquisition of undesirable skills and behaviors, especially those involving complex physical, motor, or emotional components. Additionally, common technological issues among learners, such as technophobia and the lack of necessary technologies, pose significant challenges. While advancements in network connectivity, notebook computers, PDAs, and mobile phones support e-learning, they still cannot fully replace printed workbooks or reference materials. Since e-learning provides a virtual learning environment, students receive guidance and direction solely online. This "leads to the lack of teacher supervision that traditional teaching can provide" (Wang, 2007, p. 38).

Roberts (2004) contends that e-learning cannot achieve its intended level of success without an effective and reliable Internet infrastructure. He also notes that technological issues can arise, causing even tech-savvy students to become confused and disoriented online (p.77). Additionally, the development of web and software for e-learning is costly, as institutions must invest substantial funds to establish a robust e-learning system (Catherall, 2005, p.18).

Moreover, effective e-learning requires users to possess specific knowledge and skills to utilize multimedia, internet, and web technologies properly. The absence of these skills prevents users from fully benefiting from e-learning's valuable services. Consequently, learners need access to resources such as computers, the internet, and software, as well as proficiency in programs like word processing, internet browsers, and email.

Furthermore, many educators lack the motivation to engage with e-learning. They are often unable to guide their students in using it effectively because there is insufficient provision for training programs that equip teachers with the necessary knowledge and skills for e-learning. Other scholars argue that e-learning can have negative physical effects, such as straining eyesight and causing other health issues, leading to physical inactivity and related diseases (Behera, 2013; Collins, Buhalis, Peters, 2003).

Finally, advancements in technology, particularly in communication technologies and software, are expected to mitigate, if not eliminate, many of these disadvantages and negative effects. Moreover, it is undeniable that e-learning is rapidly becoming a reliable form of educational delivery, and its various benefits and advantages ensure its significant role in the overall learning process (Pongpech, 2013).

1.5. The relation between Technology and E-learning

The integration of technology in education has fundamentally transformed the way we teach and learn. E-learning, which leverages technological tools and platforms to deliver educational content, has seen significant growth and development. At the heart of e-learning is technology, which provides the infrastructure for delivering educational content. Learning Management Systems (LMS) like Moodle, Blackboard, and Canvas enable the organization, delivery, and tracking of educational materials and student progress. Technology can serve as a catalyst for innovative teaching practices that enhance learning (Bruff, 2019). This foundational role of technology ensures that e-learning is efficient and scalable.

E-learning's primary advantage lies in its ability to provide flexible and accessible education. Students can access courses from any location and at any time, making education more inclusive. Technology has the potential to bridge the gap between privileged and underprivileged students by providing universal access to high-quality education (Wagner, 2008). This flexibility caters to diverse learning needs and schedules, making lifelong learning a tangible reality. Technology enriches the learning experience by incorporating multimedia elements such as videos, interactive simulations, and gamified content. Interactive simulations and serious games offer immersive learning experiences that traditional methods cannot match (Aldrich, 2005). These

interactive elements not only engage students but also help in the deeper understanding of complex concepts.

One of the most significant impacts of technology on e-learning is the ability to personalize learning experiences. Adaptive learning systems use algorithms to analyze student performance and tailor educational content to individual needs. Personalized learning through technology allows students to master concepts at their own pace, catering to individual strengths and weaknesses (Wiley, 2018). This personalized approach ensures that each learner can achieve their full potential.

While the benefits of integrating technology in e-learning are substantial, several challenges need to be addressed. The digital divide remains a significant barrier, with unequal access to technology exacerbating educational inequalities. Furthermore, data privacy concerns and the need for effective teacher training in using new technologies are critical issues. For technology to fulfill its promise in education, we must ensure equitable access and address the ethical implications of data use (Ng, 2019). The future of e-learning looks promising, with emerging technologies such as artificial intelligence (AI), virtual reality (VR), and augmented reality (AR) poised to further revolutionize education. AI has the potential to provide even more personalized and efficient learning experiences, transforming education as we know it (Luckin, 2020). These advancements promise to create more engaging, effective, and inclusive learning environments. The relationship between e-learning and technology is deeply interconnected and continuously evolving. Technology not only supports e-learning but also enhances its scope and effectiveness. As we continue to innovate and integrate new technological advancements, the potential for e-learning to provide high-quality, accessible, and personalized education will expand. Addressing the accompanying challenges will be crucial to fully realizing the benefits of this symbiotic relationship.

In summary, the synergy between e-learning and technology is reshaping education, offering unparalleled opportunities and posing significant challenges. The future of education hinges on our ability to leverage technology in ways that are inclusive, ethical, and pedagogically sound.

1.6. E-learning Strategies

In the evolving landscape of education, the integration of e-learning has become a pivotal strategy for enhancing the quality and accessibility of education. Amadi Martha Nkechinyere (2011) offers comprehensive insights into the implementation of e-learning strategies that can drive institutional success.

1.6.1. Open-Source

Develop and adopt strategies to implement open-source software. Open-source programs of excellent quality are available for most educational and training applications. Beyond the significant cost savings, open source can also offer enhanced quality and reliability. However, institutions cannot transition to open source overnight. Firstly, prioritize open-source applications when new software needs are identified. Secondly, develop plans to shift from proprietary to open-source software. Larger institutions might consider partnering with open-source companies that offer support and consultancy services (Amadi, 2011, p. 980).

1.6.2. Develop Partnerships and Networks

Institutions should proactively seek to establish partnerships and networks focused on e-learning. These partnerships can vary based on needs and might include sharing resources, developing resources, and delivering courses and programs. Utilizing collaborative tools and groupware can enhance the effectiveness of these partnerships. Institutions might also consider forming developmental partnerships with software companies and material developers that transcend traditional customer-supplier relationships (Amadi, 2011, p. 980).

1.6.3. Integrate ICT With the Whole Curriculum

Adopt a holistic approach to integrating e-learning throughout the curriculum. Instead of viewing e-learning as an isolated activity suited only for specific target groups or courses, consider how it can enhance existing educational offerings. This approach doesn't require all courses to be delivered via e-learning, but recognizes the

potential for diverse e-learning applications to be integrated into the organization's educational and teaching strategies (Amadi, 2011, p. 980).

1.6.4. Available Resources

A plethora of free resources is available online, and the number of collections and repositories of free learning resources is rapidly increasing. The main obstacle to using these materials is often the unawareness of their existence by teachers, coupled with a lack of skills in locating them. Searching for and utilizing free materials should be a key component of any training for teachers and trainers in e-learning (Amadi, 2011, p. 980).

1.6.5. Evaluate E-learning Practice

As e-learning remains in a phase of experimentation, it's vital for institutions to understand what is effective and what isn't. This calls for a robust strategy that focuses not just on technology but on learning outcomes. Formative evaluations should be integral to all e-learning plans and projects, with evaluation results informing ongoing development and strategic reviews (Amadi, 2011, p. 980).

1.7. The effects of e-learning strategies in transforming education in the 21st century

The 21st century has witnessed a profound transformation in education, driven by the rapid advancement and integration of e-learning strategies. These strategies have not only revolutionized the traditional educational landscape but have also expanded access, enhanced learning experiences, and provided unprecedented opportunities for personalized education. The impact of e-learning is evident across various dimensions of education, including accessibility, engagement, and the customization of learning experiences.

1.7.1. Enhanced Accessibility and Flexibility:

One of the most significant effects of e-learning strategies is the increased accessibility to education. Digital platforms and online courses have made education more inclusive, breaking down geographical barriers and allowing students from diverse backgrounds to access high-quality learning resources. According to Wagner

(2010), Technology has the potential to bridge the gap between privileged and under-privileged students by providing universal access to high-quality education (P198). This democratization of education ensures that learning opportunities are available to anyone with internet access, thereby fostering greater educational equity.

1.7.2. Personalized Learning Experiences:

Personalized learning is another transformative effect of e-learning strategies. Adaptive learning systems leverage algorithms to analyze student performance and tailor educational content to individual needs. This personalized approach allows students to learn at their own pace, addressing their unique strengths and weaknesses. Wiley (2018) notes, "Personalized learning through technology allows students to master concepts at their own pace, catering to individual strengths and weaknesses." By providing customized learning experiences, e-learning ensures that each student can achieve their full potential, enhancing overall educational outcomes.

1.7.3. Enhancing Learning with E-Learning Platforms

The integration of e-learning has prompted the development of innovative teaching practices. Learning Management Systems (LMS) such as Moodle, Blackboard, and Canvas enable educators to organize, deliver, and track educational materials and student progress efficiently. Bruff (2019) points out that "Technology can serve as a catalyst for innovative teaching practices that enhance learning (P.09). These platforms facilitate the seamless integration of e-learning into traditional curricula, allowing for a blended learning approach that combines the best of both worlds.

1.8. Conclusion

In conclusion, this chapter has embarked on a comprehensive exploration of e-learning, tracing its historical trajectory from its humble beginnings in correspondence courses to the sophisticated online platforms prevalent today. We have examined the diverse classifications of e-learning, encompassing synchronous and asynchronous models tailored to meet the diverse needs of learners. Highlighting the myriad benefits of e-learning, including increased accessibility, flexibility, and personalized learning experiences, we have also acknowledged challenges such as the digital divide and the imperative of self-discipline in online learning environments. Technology serves as the cornerstone of e-learning, with continual advancements reshaping delivery methods and user experiences. E-learning strategies harness these advancements, integrating interactive elements, simulations, and collaborative tools to enrich engagement and cater to individual learning preferences. The transformative impact of e-learning strategies is evident, reshaping the educational landscape by enhancing accessibility, engagement, and effectiveness. By fostering a learner-centric approach, e-learning empowers individuals to take charge of their educational journey, irrespective of their geographical location or socio-economic background. Looking forward, the integration of emerging technologies such as artificial intelligence, virtual reality, and big data holds promise for further personalization and immersive learning experiences. E-learning stands poised to play a pivotal role in shaping the future of education, ensuring that learning remains a dynamic and lifelong endeavor for all.

CHAPTER-2. The role of technology in transforming Education in the 21st century

Introduction

Education stands at the crossroads of tradition and innovation, with technology playing an increasingly integral role in its evolution. This chapter embarks on a journey to explore the dynamic interplay between education and technology, shedding light on its various types, defining its essence, and emphasizing its paramount importance. From traditional classrooms to online platforms, education manifests in myriad forms, each imbued with the power to shape minds, transform societies, and drive progress.

2.1. Historical Overview of Education

Education has been an indispensable facet of human civilization since time immemorial, intricately interwoven with the fabric of society, culture, and human progress. Throughout history, from the dawn of ancient civilizations to the contemporary era, the evolution of education has been shaped by a myriad of socio-cultural, economic, and political forces, each leaving its indelible imprint on the educational landscape. In the annals of antiquity, civilizations such as Mesopotamia, Egypt, India, and China laid the foundation for formalized education. Within these ancient societies, education was often the privilege of the elite classes, serving primarily to transmit practical skills, religious doctrines, and cultural traditions from one generation to the next. Temples, scribal academies, and royal courts emerged as centers of learning, where knowledge was revered and passed down through oral traditions and early forms of written language. Painter (1904) describes, "In ancient Egypt, education was in the hands of the priests, and it was closely connected with religion. The young were instructed in reading, writing, and arithmetic, as well as in the principles of morality and religion." Similarly, Painter notes, "In India, education was primarily religious, the chief aim being the understanding of the sacred Vedas" (Painter, 1904). Classical antiquity, particularly the golden age of Greece and Rome, witnessed a flourishing of

intellectual and philosophical inquiry that profoundly influenced educational thought. In ancient Greece, education was synonymous with paideia, a holistic approach to intellectual and moral development that encompassed subjects such as rhetoric, philosophy, mathematics, and physical fitness. The philosophical schools of Athens, including the Academy founded by Plato and the Lyceum established by Aristotle, nurtured a tradition of critical thinking and dialectical reasoning that laid the groundwork for Western educational philosophy. Painter (1904) highlights, "The Greeks were the first to recognize that education should not only train the mind, but also cultivate the body and develop moral character (P.53) Similarly, in ancient Rome, education (educare) encompassed both the transmission of knowledge and the cultivation of character, with an emphasis on civic virtues, military training, and moral education. The Roman system of education, influenced by Greek models, emphasized the importance of disciplina (discipline) and virtus (virtue) in shaping the ideal citizen. Painter (1904) states, "Roman education aimed at preparing the young for the duties of public and private life, stressing the cultivation of virtue and public spirit (P.70)."

The Middle Ages witnessed the ascendancy of Christianity as a dominant cultural and intellectual force in Europe, shaping educational practices and institutions. Monastic schools, cathedral schools, and eventually universities emerged as centers of learning, where religious instruction, Latin grammar, and scholastic philosophy formed the core of the curriculum. Education during this period was deeply rooted in theological doctrine, with the aim of nurturing piety, literacy, and devotion to God. Painter (1904) observes that in the Middle Ages, the Church predominantly controlled education, aiming to ready the youth for a life dedicated to religious responsibilities and service.

The Renaissance, a period of cultural rebirth and intellectual ferment, saw a revival of classical learning and humanistic education. Humanist scholars such as Petrarch, Erasmus, and Montaigne advocated for a liberal arts curriculum that emphasized the study of ancient languages, literature, history, and moral philosophy. The printing press, invented by Johannes Gutenberg in the 15th century, revolutionized the dissemination of knowledge, democratizing access to education and fueling the spread of humanist ideas across Europe. Painter (1904) notes that the Renaissance introduced a

fresh approach to education. It aimed to stimulate interest in the wisdom of ancient classics, cultivate a passion for truth, and nurture respect for the significance and value of humanity.

The Enlightenment ushered in an era of radical intellectual and social change, challenging traditional authority and championing reason, science, and individual freedom. Enlightenment thinkers such as John Locke, Jean-Jacques Rousseau, and Immanuel Kant advanced bold ideas about education as a means of fostering critical thinking, civic engagement, and social progress. Education was seen not only as a vehicle for transmitting knowledge but also as a catalyst for personal autonomy, social mobility, and the advancement of human rights. According to Painter (1904), "The Enlightenment emphasized the use of reason in education. It sought to liberate the human mind from the bonds of ignorance and superstition, and to promote intellectual and moral autonomy."

As we navigate the complexities of the contemporary world, with its rapid technological advancements, globalization, and cultural diversity, the legacy of historical perspectives on education continues to shape our understanding of its purpose, principles, and practices. By examining the rich tapestry of educational history, we gain insights into the enduring challenges and opportunities that lie ahead, guiding us in our ongoing quest to realize the transformative potential of education for individuals and societies alike.

2.2. Definition of Education

Education is the bedrock of human growth and development, empowering individuals with essential knowledge and skills. It spans from early childhood to adulthood, shaping minds and shaping societies. As a fundamental right and a catalyst for progress, education unlocks doors to opportunity and fosters a brighter future for all.

According to Durkheim (1956), "education is the influence exercised by adult generations on those that are not yet ready for social life" (p. 71). This suggests that the main goal of education is to aid children in developing intellectual abilities and enhancing their physical skills. Furthermore, schools should encourage students to adopt the moral values necessary for functioning in a political society. If children are

not guided to achieve these goals, society may encounter social issues and incur higher costs to address them.

Dewey (1897) suggests that effective education relies on the interaction between individuals and their environment, emphasizing present living over mere preparation for the future. He underscores the importance of moral instruction and envisions schools as integral components of the broader community. Additionally, Dewey contends that education is not separate from life but an ongoing process of reconstructing experiences. By providing children with meaningful experiences within the school environment, they can acquire practical knowledge applicable to real-life situations, thus preparing them for the future. Consequently, experts analyze curricula based on grades and subjects to guide children in developing behaviors conducive to fostering a better society.

Moore (2010) delineates education as the societal commitment to cultivating a desired type of individual and instilling expected values. Accordingly, children are expected to embody specific characteristics, attitudes, knowledge, and skills deemed favorable by society. Moore asserts that an educated individual should possess intellectual prowess alongside moral sensitivity, mathematical proficiency, scientific acumen, and a comprehensive understanding of history and geography. However, societal observations suggest that the educational system has not effectively nurtured the desired educated individual.

Russel (1926) elucidates that education should serve as a guiding mechanism to facilitate the development of children's capabilities and skills. He contends that the educational system should afford all children, regardless of gender, the opportunity to access the highest level of education. Similarly, Durkheim (1956) underscores the primary aim of education as preparing children for their roles as productive workers and contributing members of society. He (1956) emphasizes education's function in shaping individuals into social beings.

2.3. Types of Education

Education can be divided into four categories: formal education, non-formal education, informal education, and educational technology.

2.3.1. Formal Education

Ngaka, Openjuru and Mazur (2012) denotes a "hierarchically structured and chronologically graded educational system", which starts at pre-school and continues through university and includes "academic studies, a variety of specialized programs and institutions for full-time technical and professional training" (p. 110) Formal education is a structured system of learning found in institutions like schools, colleges, and universities. It follows a predefined curriculum, often overseen by trained educators who guide students through various subjects. This education progresses through stages, from primary to secondary levels, often resulting in academic degrees or certifications.

In formal education, students follow a set curriculum covering subjects like math, science, literature, history, and arts. Teachers, equipped with expertise in their subjects and teaching methods, facilitate learning in classrooms, lecture halls, and laboratories. Students advance through grades based on their mastery of content and performance on assessments. Assessment is integral to formal education, with tests, projects, and exams used to evaluate student progress. Successful completion results in credentials such as diplomas or degrees. Formal education is regulated to maintain quality standards and may be accredited by governing bodies.

Ultimately, formal education aims to equip individuals with skills and knowledge for personal, social, and professional development. It fosters critical thinking, prepares students for societal participation, and lays the groundwork for further education or career pursuits.

2.3.2. Informal education

Informal education is learning that happens outside traditional classrooms, offering flexibility and accessibility across various environments like homes, communities, museums, libraries, and online platforms. Sakari. S (1993) highlights the importance of informal education in engaging learners and enhancing understanding through hands-on, interactive experiences.

Salmi (1993) emphasizes that informal education, notably in science centers, offers learners chances to interact with scientific concepts via hands-on, interactive exhibits, igniting curiosity and enabling a more profound comprehension.

Informal education encourages lifelong learning by fostering intrinsic motivation and curiosity. Salmi (1993) points out that science center's capture visitors' interest with interactive exhibits, stimulating continuous exploration beyond the initial experience. These settings bridge the gap between theoretical knowledge and practical application, making abstract concepts tangible.

Moreover, informal education promotes social interaction and collaborative learning. In environments like science centers, visitors often engage in group activities and discussions, enhancing their understanding. Salmi (1993) observes that informal educational settings promote dialogue and collaboration, which are vital for successful learning and the enhancement of communication abilities.

Informal education plays a crucial role in providing engaging, accessible learning experiences outside traditional classrooms. As Salmi (1993) illustrates, science centers exemplify the strengths of informal education by motivating learners, making scientific concepts relatable, and promoting lifelong learning and collaboration.

2.3.3. Non-formal Education

Non-formal education, as described by Ngaka, Openjuru, and Mazur (2012), refer to educational activities that take place outside the traditional school system. This type of education includes adult literacy programs and continuing education for adults and out-of-school youth, typically without a focus on certification (p. 111). Non-formal education can influence children's behavior in both positive and negative ways, heavily depending on the environment in which it occurs. While it is challenging to monitor students outside school settings, parents should remain informed about their children's whereabouts and social interactions. Unexpected behaviors can also arise within structured school environments during breaks when children interact with their peers (MoNE of Turkey 2016).

Non-formal education is aimed at individuals who have not participated in formal educational systems, providing them with opportunities to develop skills that can enhance their professional careers. This type of education often complements formal education and can appear in various formats. For instance, non-formal education includes programs that improve literacy and numeracy skills, offer professional development in specific fields, promote healthy lifestyles, facilitate the socialization of immigrants, and encourage productive use of time.

Moreover, non-formal education plays a crucial role in lifelong learning, providing flexible and accessible learning opportunities that cater to diverse needs and circumstances. It supports personal and professional growth by addressing gaps that formal education might not cover, thereby helping individuals to adapt to changing societal and labor market demands. Through its varied forms, non-formal education empowers individuals to acquire new skills, gain knowledge, and foster behaviors that contribute to their overall well-being and societal participation.

2.4. Educational technology

The term "educational technology" is increasingly integrated into teaching and learning processes, including English Language Teaching, to enhance learning outcomes. However, defining educational technology precisely has been challenging (Damian, 2019). This difficulty arises partly because it is considered an applied social science and due to skepticism about its reliability. Finn (1972) argues that the field needs to establish credibility with professional educators for its development and progress. Consequently, defining the field is a complex task. Ely (1970) suggests that instead of seeking a final definition, experts in the field should engage in ongoing discussions to develop a possible definition.

Technology has evolved significantly over the years, with its impact on the educat ector tracing back 2,500 years. In modern classrooms, technology has revolutionized learning, prompting teachers to adopt innovative teaching techniques. Today, various technologies like paper, cloth, and glass are commonplace, and the term 'Educational Technology' is widely embraced in the educational field (Khvilon, 2002). The transfer of knowledge between societies has been facilitated by communication tools and technologies such as writing, images, television, computers, and the Internet. The

ability to store data and experiences in books and other media has driven societal evolution (Parshakova, 2013).

The earliest methods of disseminating knowledge involved handwritten books, which changed dramatically with the invention of the printing press in the 15th century. This technology enabled the mass production of books, allowing knowledge to be widely accessible and easily transported. From the 19th to the 21st century, innovations like radio, photography, and cinema ushered society into the technological age. Devices such as televisions, CD players, DVDs, computers, and gadgets like Smartphones, iPods, iPads, and iPhones have played crucial roles in communication and information dissemination. These advanced technologies have made it possible to store and share vast amounts of information globally with ease (Moreira, 2008).

2.5. Types of Educational Technology

Educational technology encompasses a diverse array of tools, resources, and technologies designed to enhance teaching, learning, and educational outcomes. Here are some types of educational technology:

2.5.1. Online Learning Platform

Online learning depends on the internet and technological devices. Heng and Sol (2021) noted, "The efficacy of online learning is inherently tied to the availability and quality of internet access and the technological devices used by learners." Online learning platforms are digital environments that offer a wide range of educational resources, courses, and tools for learners to access remotely via the internet. These platforms provide opportunities for individuals to engage in self-paced learning, acquire new skills, and pursue educational goals from anywhere with an internet connection. As Heng and Sol (2021) explain, "Online learning platforms vary significantly in terms of their content, delivery methods, and target audiences, but they generally share several common features." Online courses often incorporate interactive multimedia content, including video lectures, slideshows, animations, and simulations, to engage learners and enhance understanding of course materials. Interactive quizzes, assignments, and assessments may also be included to reinforce learning and measure progress. "The use of multimedia elements in online courses enhances engagement and

helps in the retention of information," according to Heng and Sol (2021). One of the key advantages of online learning platforms is the flexibility they offer in terms of pacing and scheduling. Learners can progress through courses at their own pace, accessing course materials and completing assignments according to their individual preferences and availability. Heng and Sol (2021) highlight, "This flexibility allows learners to balance their studies with personal and professional responsibilities more effectively (P.15).

Many online learning platforms feature discussion forums, messaging tools, and collaborative projects that facilitate interaction and collaboration among learners. This peer-to-peer interaction allows learners to share ideas, ask questions, and engage in meaningful discussions with classmates from around the world. As noted by Heng and Sol (2021), "The interactive elements of online learning platforms foster a sense of community and support among learners, enhancing the overall educational experience."

2.5.2. Learning Management System (LMS)

A Learning Management System (LMS) is a comprehensive software platform designed to facilitate the administration, delivery, and management of educational content and training programs. At its core, an LMS serves as a centralized hub where instructors, administrators, and learners can interact, collaborate, and access a wide range of learning materials and resources. From academic institutions to corporate training environments, LMS platforms play a crucial role in streamlining the learning process, optimizing instructional delivery, and enhancing learner engagement and outcomes (Smith, J, 2021, P.23)

One of the primary functions of an LMS is content management, allowing instructors to create, upload, organize, and distribute course materials such as lectures, presentations, videos, documents, and assessments. This centralized repository not only simplifies content creation and distribution but also ensures consistency and accessibility across various devices and locations. According to Oliveira, Cunha, and Nakayama (2016), “LMS platforms provide a unified system that enables educators to

deliver content seamlessly, ensuring that all students receive the same high-quality educational materials regardless of their location (P.138).

Additionally, LMS platforms often feature robust assessment and grading tools, enabling instructors to design quizzes, exams, assignments, and surveys to evaluate learners' progress and performance accurately.

Oliveira, Cunha, and Nakayama (2016) highlight that “these tools are critical for maintaining academic integrity and providing timely feedback, which is essential for student development” (P.142). LMS platforms facilitate communication and collaboration among instructors and learners through features such as discussion forums, messaging systems, and virtual classrooms. These tools promote active engagement, peer interaction, and knowledge sharing, fostering a dynamic learning environment conducive to critical thinking, problem-solving, and teamwork. As noted by Oliveira, Cunha and Nakayama (2016), “the collaborative features of LMS platforms encourage a community of learning where students can engage with each other and their instructors, enhancing the overall educational experience”.

Moreover, LMS platforms often incorporate analytics and reporting functionalities, allowing administrators and instructors to track learners' progress, identify areas for improvement, and make data-driven decisions to enhance teaching and learning outcomes. “The ability to analyze learner data is invaluable for educators aiming to tailor their instructional strategies to meet the needs of their students,” Oliveira, Cunha and Nakayama (2016). In addition to traditional course delivery, many LMS platforms support blended learning and flipped classroom models, where instructors can blend online and face-to-face instruction to cater to diverse learning preferences and schedules. “Blended learning models supported by LMS platforms provide flexibility and accessibility, making education more inclusive and adaptable to various learning styles,” Oliveira, Cunha and Nakayama (2016).

Furthermore, LMS platforms often integrate with external tools and applications, such as video conferencing software, learning analytics platforms, and content authoring tools, to enhance functionality and interoperability. Oliveira, Cunha and Nakayama. (2016) state that “integration with external tools expands the capabilities of

LMS platforms, allowing for a more comprehensive and interactive learning experience”

2.5.3. Virtual Reality (VR) and Augmented Reality (AR)

Rajeev Tiwari, Neelam Duhan, Mamta Mittal, Abhineet Anand, and Muhammad Attique Khan (2022) state that "Virtual reality (VR) is a well-known technology that has seen a surge of growth across multiple fields like gaming, marketing, customer service training, and education." Virtual Reality (VR) and Augmented Reality (AR) are two innovative technologies that have gained significant traction in the field of education. VR immerses users in a completely virtual environment, often using a headset or goggles.

In an educational context, VR allows learners to explore simulations, visit historical sites, conduct experiments, and engage in hands-on activities in a safe and controlled virtual space. "For example, students can virtually dissect a frog, explore the human body at a cellular level, or travel to distant planets to study astronomy" (Tiwari et al., 2022). On the other hand, AR overlays digital content onto the real world, typically through the use of a smartphone or tablet. AR enhances the physical environment by adding digital elements such as images, videos, or 3D models.

In education, AR can bring textbooks to life, enabling students to interact with 3D models of complex concepts, such as molecules or architectural structures. It can also facilitate interactive storytelling, historical reenactments, and language learning by overlaying contextual information onto real-world objects or locations. Both VR and AR offer unique benefits for education, including increased engagement, enhanced retention, and the ability to cater to diverse learning styles.

According to Elmqaddem (2019), "By providing immersive, interactive, and experiential learning experiences, these technologies have the potential to transform traditional teaching methods and unlock new possibilities for educational exploration and discovery" (p. 237). As VR and AR continue to evolve and become more accessible, their integration into educational settings is expected to become increasingly prevalent, shaping the future of learning in exciting and innovative ways. Elmqaddem (2019) also notes that "the adoption of VR and AR in education is not just a trend, but

a significant advancement in educational technology that enhances learning outcomes" (p. 241).

2.5.4. Gamification

Deterding et al. (2011) defines gamification as the use of game design elements in non-game contexts, is a fairly new and rapidly growing field. It is the integration of game elements, mechanics, and principles into non-game contexts, such as education, to enhance engagement, motivation, and learning outcomes. In educational settings, gamification leverages elements such as points, badges, leaderboards, challenges, levels, and rewards to make learning more interactive, enjoyable, and effective. By incorporating elements of play and competition, it taps into intrinsic motivators such as autonomy, mastery, and purpose, encouraging learners to actively participate in their own learning process. For example, students may earn points or badges for completing assignments, mastering concepts, or demonstrating specific skills. Leaderboards can foster healthy competition and peer interaction, while challenges and levels provide opportunities for progression and achievement.

Deterding et al. (2011) explain that "gamification involves applying the motivational affordances of games to real-world processes or activities to motivate and enhance participation" (p. 10). This approach can be applied across various educational contexts and subjects, from elementary school to higher education, and across disciplines such as math, science, language arts, and social studies. It can also be used in professional development and corporate training programs to engage employees and enhance skill acquisition. Moreover, gamification can promote collaboration, critical thinking, problem-solving, and decision-making skills by presenting learners with meaningful challenges and opportunities for exploration and experimentation. It can also provide immediate feedback, allowing learners to track their progress and make adjustments in real-time. Deterding et al. (2011) highlight that "by integrating feedback mechanisms such as points and badges, gamification helps to create a continuous feedback loop that reinforces desired behaviors" (p. 13). While gamification is not a one-size-fits-all solution and should be implemented thoughtfully and purposefully, when done effectively, it has the potential to transform learning experiences, increase motivation, and improve retention and application of knowledge and skills. As

technology continues to evolve, gamification is expected to play an increasingly prominent role in education, offering new possibilities for personalized and engaging learning experiences.

2.5.5. Adaptive Learning Systems

Brusilovsky, Karagiannidis, and Sampson (2004) explore into the multifaceted nature of adaptive learning systems, emphasizing their pivotal role in tailoring learning experiences to individual needs, preferences, and abilities. These systems, as highlighted by the authors, harness the power of data analytics and algorithms to dynamically adjust instruction, ensuring that the pace, content, and delivery align seamlessly with each learner's unique profile.

Operating across diverse educational contexts, from early childhood education to professional development, adaptive learning systems offer a spectrum of personalized support and scaffolding. Their capacity to continuously monitor and analyze learners' interactions and performance enables them to provide targeted interventions, remediation, and enrichment activities, thereby optimizing learning outcomes and fostering a deeper understanding of concepts.

The advantages of adaptive learning systems, as expounded by Brusilovsky, Karagiannidis, and Sampson (2004), are manifold. They not only enhance engagement but also facilitate mastery and retention of knowledge and skills. By tailoring learning paths to accommodate individual strengths and weaknesses, these systems effectively address the diverse needs of learners, promoting inclusivity and equity in education.

Nonetheless, amidst the promise of revolutionizing education, adaptive learning systems confront a spectrum of challenges. Data privacy concerns loom large, necessitating robust frameworks to safeguard sensitive information. Furthermore, the effective integration of these technologies into educational practices hinges on comprehensive teacher training and professional development initiatives

Despite these hurdles, Brusilovsky, Karagiannidis, and Sampson (2004) remain optimistic about the transformative potential of adaptive learning systems. As

technological advancements continue unabated, these systems are poised to assume a pivotal role in delivering personalized and effective learning experiences, transcending age barriers and nurturing a culture of lifelong learning

2.6. The Effect of Technology in Transforming Education in the 21st Centry

The impact of technology on education in the 21st century has been profound, reshaping traditional teaching methods and revolutionizing the learning experience. As stated by Zhao, Pugh, Sheldon, and Byers (2002), "Technology has the potential to transform education by extending the learning space beyond the confines of the classroom and providing access to a wealth of information and resources".

One significant effect of technology in education is the rise of online learning platforms, which offer flexible and accessible educational opportunities to learners worldwide. Research by Allen and Seaman (2017) highlights the growing prevalence of online education, with enrollment rates in online courses steadily increasing over the past decade. This shift towards digital learning environments has democratized education, making it more inclusive and adaptable to diverse learning needs.

Furthermore, technology has facilitated personalized learning experiences through the use of adaptive learning systems. According to Imhof, Bergamin, and McGarrity (2020), these systems leverage data analytics and algorithms to tailor instruction to individual students, thereby enhancing engagement and improving learning outcomes. This sentiment is echoed by Knewton, a leading provider of adaptive learning technology, which emphasizes the importance of personalized learning in addressing the diverse needs of students (Knewton, n.d.).

Moreover, technology has enabled collaborative learning experiences that transcend geographical boundaries. Platforms such as Google Classroom and Microsoft Teams facilitate real-time communication and collaboration among students and teachers, fostering a sense of community and enhancing peer-to-peer learning (Google, n.d.; Microsoft, n.d.). However, the integration of technology in education is not without its challenges. Concerns about data privacy, digital equity, and the digital divide remain prevalent. As cautioned by UNESCO (2020), efforts to harness the potential of

technology in education must be accompanied by initiatives to ensure equitable access to technology and digital literacy skills for all learners.

The impact of technology on education in the 21st century is undeniable. From online learning platforms to adaptive learning systems, technology has transformed the educational landscape, offering new opportunities for teaching and learning. However, addressing challenges such as digital equity and privacy concerns is essential to ensure that technology remains a force for positive change in education.

2.7. Conclusion

In conclusion, the integration of educational technology has revolutionized the landscape of education, offering transformative opportunities to enhance teaching and learning experiences, expand access to education, and prepare students for success in the 21st century. From personalized learning experiences to global connectivity and digital literacy skills development, educational technology has become an indispensable tool in empowering educators, engaging learners, and fostering lifelong learning. However, while the benefits of educational technology are undeniable, its effective implementation requires thoughtful planning, ongoing support, and a commitment to equity and inclusion. By harnessing the power of educational technology responsibly and innovatively, educators and institutions can unlock the full potential of technology to shape a future where education is accessible, engaging, and empowering for all learners, regardless of their backgrounds or circumstances.

CHAPTER-3. Practical Prat

Introduction

The purpose of this study is to investigate students' attitudes towards e-learning as a mode of education in the 21st century and to explore their experiences with various e-learning technologies, tools, and platforms. In this section of the chapter, we will analyze the data collected from third-year LMD students at the University of Kasdi Merbah Ouargla regarding their perspectives on e-learning and educational technologies.

3.1. Methodology

This research follows a descriptive approach, and it uses quantitative and qualitative methods. The tool that is used to collect students' data is a questionnaire, since it is an easy and helps to get large number of answers in short period time. In addition, the result of questionnaire can be easily analyzed and quantified.

3.1.1. Participants:

In this study, we choose a sample composed of thirty (30) Third year LMD (instrumentation) students registered for the academic year 2023/2024 at the department of Electronics and Communication at the University of Kasdi- Merbah - Ouargla.

3.1.2. Research Instruments

The tool that is used in this research is a questionnaire. Because it is an effective way and

economically to get a lot of information from large number of participants in short period of time. In addition, it allows obtaining reliable results.

3.1.2.1. Description of the Questionnaire

This questionnaire consists of fifteen questions (15) divided into three sections. The first section composed of three questions related to the gender, age, also some background information of the participant regarding their previous exposure to e-learning. The second section contains seven questions about the extent of students' knowledge of the history of e-learning, its types, advantages and disadvantages, strategies, and the role of technology in e-learning. The last section contains five questions about the extent of their knowledge of education and its types, the extent of their knowledge of

technological educational technology and its types, and the impact of technology on education in the 21st century.

3.1.2.2. Administration of the Questionnaire

To collect information for this study, we used a questionnaire to investigate students' knowledge of e-learning and education and the difficulties they may encounter Which can pose obstacles for students. The questionnaire was presented to (30) of third year LMD students at Kasdi Merbah university- Ouargla. All students answered this questionnaire via email.

3.2. Analysis of the Result

Section one: Background Information

Question (1)

Gender:

a. *Male*
b. *Female*

Options	N (Numbers)	Percentage %
Male	25	83.3%
Female	03	16.7%
Total	30	100%

Table 1 Student's Gender

Table (1) shows the gender of students. The sample composed of (30) students. Most of them are males where they represent (83.3%) of the participants.

Question (2)

Age:

a. *Between 18-24*
b. *Between 24-30*
c. *Over 30*

Options	N (Numbers)	Percentage%
Between 18-24	24	80%
Between 24-30	6	20%
Over 30	0	0%
Total	30	100%

Table 2 Students' Age*

Table (2) shows the students' age. the samples composed of (30) students, most of them (80%) aged between 18-24 years. However, the minority of them, (20%) of participants aged between 24-30 years. On the other hand, no one aged over 30.

Question 3

Have you ever experienced e-learning?

a. Yes

b. No

Options	Numbers	Percenatge
Yes	28	93.3%
No	2	6.7%
Total	30	100%

Table 3 Students' experience of e-learning

Table (3) demonstrates that the most of students (97%) had experience in e-learning. As for the minority of them (3%) the results showed that they had no experience in e-learning.

Section two: E-learning

Question 4

To what extent do you believe e-learning is a recent phenomenon or has historical roots?

a. *Completely recent*
b. *Has some historical roots*
c. *A well –established phenomenon with long historical roots*

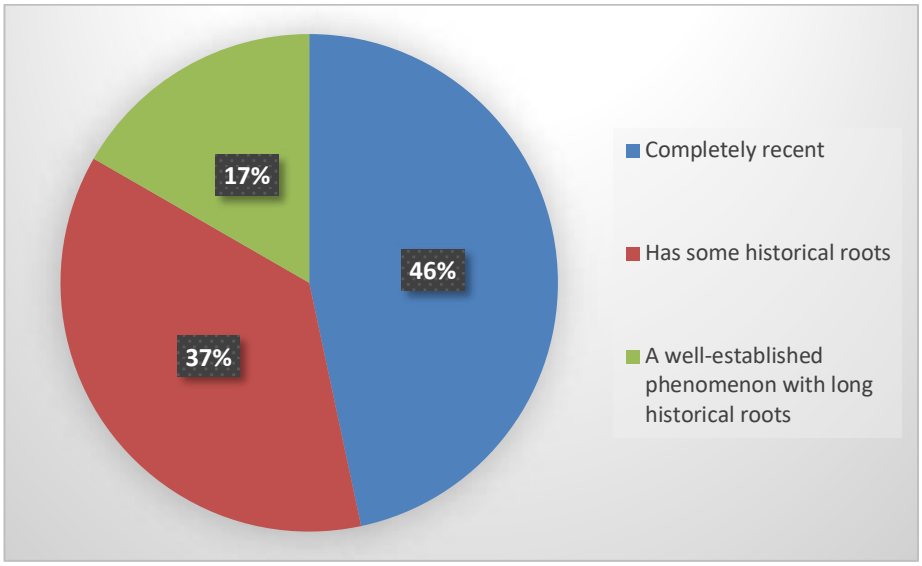

Figure 1 Students' knowledge of the history of E-learning.

Figure (1) It shows that (46%) of students believe that the history of e-learning is completely recent, while the other half (37%) believe that it has some historical roots. The minority (17%) believes that it is an established phenomenon with long historical roots.

Question 5

Do you know what e-learning is?

a. *Yes*
b. *No*

Options	Numbers	Percentage%
Yes	28	93.3%
No	2	6.7%
Total	30	100%

Table 4 Students' knowledge of e-learning

Table (4) demonstrate that the majority (93.3%) of students know what e-learning is. While the minority (6.7%° do not know what it is

Question 5.1

If yes, E-learning is:

a. *E-learning refers to the use of electronic technologies, primarily the internet, to facilitate learning and training. It encompasses a wide range of activities, from online courses and virtual classrooms.*
b. *E-learning is a form of distance education that enables learners to access educational materials and interact with instructors, without the constraints of time and location.*
c. *E-learning is a mode of learning that leverages digital tools and resources to deliver educational experiences that are flexible, interactive, and personalized. It allows learners to engage with content at their own pace, using a variety of multimedia formats, including text, video, audio, and interactive simulations*
d. *E-learning is increasingly becoming a ubiquitous feature of education and training across various sectors, including higher education, corporate training, and lifelong learning. It offers opportunities for cost-effective and*

scalable learning solutions, as well as access to expertise and resources from around the world.

e. *All the above*

Options	Number	Percentage %
a.	20	74.1%
b.	6	22.2%
c.	1	3.7
d.	0	0%
e.	0	0%
Total	30	100%

Table 5 Students' knowledge of e-learninge

Table (5) show that the majority of respondents (74.1%) understand e-learning as the utilization of electronic technologies, primarily the internet, for learning. Additionally, a significant portion (22.2%) recognize its flexibility and accessibility, particularly in distance education. A smaller percentage (3.7%) emphasized its personalized and interactive nature. Interestingly, none acknowledged its ubiquitous presence across various sectors, and no one selected the option stating "All the above."

Question 6

Do you know what are the types of e-learning are?

a. *Yes*
b. *No*

Options	Number	Percentage
Yes	20	66.7%
No	10	33.3%
Total	30	100%

Table 6 Students' knowledge about the types of E-learning

According to table (6) The majority of students (66.7%) indicated that they possess knowledge about the types of e-learning, while 33.3% stated that they do not.

Question 6.1

If yes, which one of The among types do you know most?

a. *Blended learning*
b. *Asynchronous learning*
c. *Synchronous learning*
d. *Mobile Learning*
e. *All the above*

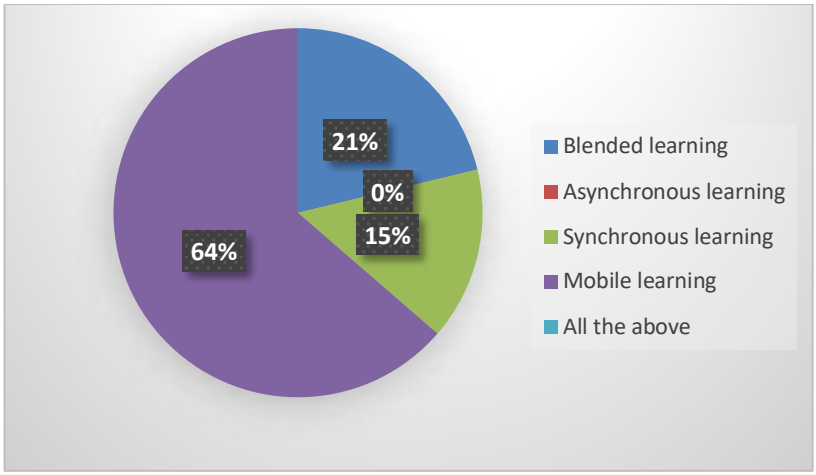

Figure 2 Students' knowledge about the types of E-learning

Figure (2) presents that the majority of students (64%) are most familiar with mobile learning, indicating a strong awareness of e-learning via mobile devices. A notable portion (21%) recognize blended learning, while fewer mentioned synchronous learning (15%). Interestingly, none selected asynchronous learning, and no one chose "All the above."

Question 7

Do you know the advantages and disadvantages of e-learning?

a. Yes
b. No

Options	Number	Percentage
Yes	24	79.3%
No	6	20.7%
Total	30	100%

Table 7 Students' awareness of the advantages and disadvantages of e-learning.

From table (7) it seems that, the majority of students (79.3%) are knowledgeable about the advantages and disadvantages of e-learning, while a smaller percentage (20.7%) indicated otherwise.

Question 7.1

If yes, which one among the following advantages do you know most?

a. Flexibility
b. Accessibility
c. Cost effectiveness
d. Scalability
e. All the above

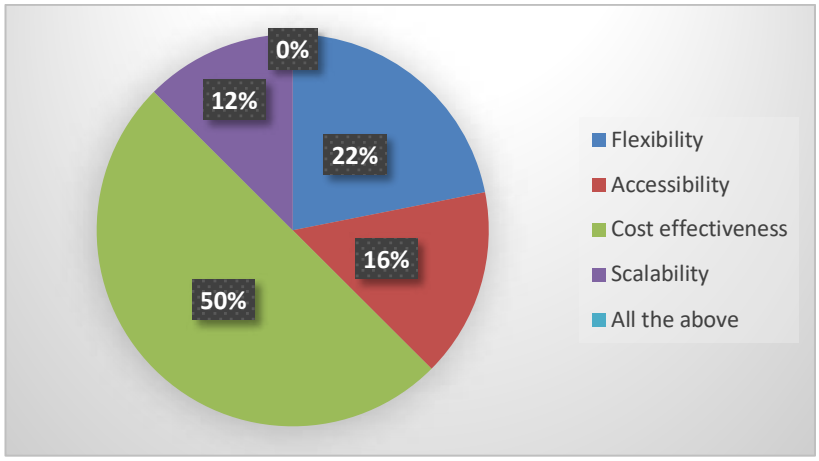

Figure 3 Students' views on the advantages of e-learning.

Figure (3) present that cost-effectiveness is the most recognized advantage of e-learning among students (50%), followed by flexibility (22%) and accessibility (16%). Scalability was mentioned by 12% of respondents. None chose "All the above."

Question 7.2

which one among the following disadvantages do you know most?

a. *Digital divide*
b. *Self -motivation and discipline*
c. *Isolation*
d. *All the above*

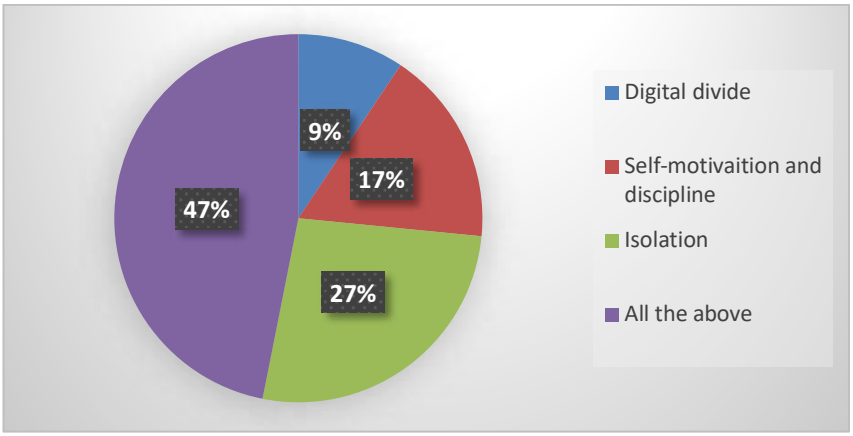

Figure 4 Students' views on the advantages of e-learning

According to figure (4), (47%) of the students recognize a combination of disadvantages in e-learning, including isolation (27%), self-motivation and discipline (17%), and the digital divide (9%). This indicates a broad understanding of the challenges learners may face in online education settings.

Question 8

Does technology enhance e-learning?

a. *Yes, significantly.*
b. *No, it hampers effectiveness.*
c. *It varies based on implementation.*
d. *Unsure, need more experience.*

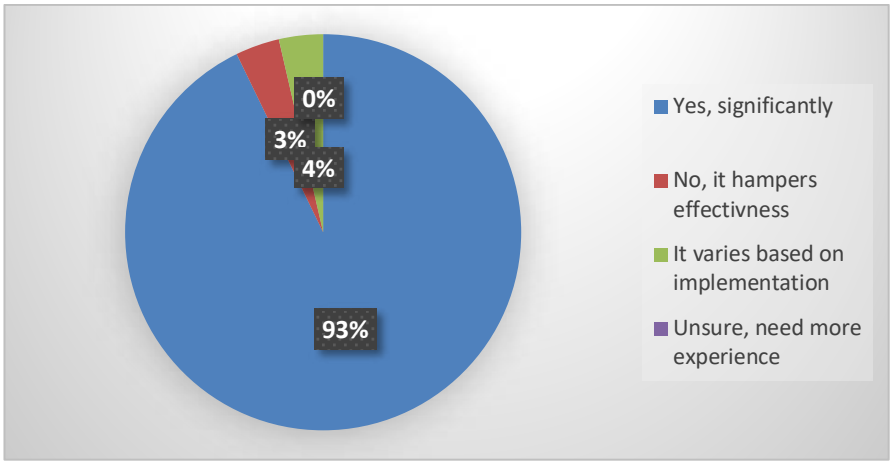

Figure 5 Students' opinion on enhancing technology for e-learning.

Figure (5) shows that the overwhelming majority of the students (93%) believe that technology significantly enhances e-learning. This indicates a strong consensus among students regarding the positive impact of technology on online education. Only a small percentage (3%) express the opinion that technology hampers effectiveness, while an additional portion (4%) believes that its impact varies based on implementation. None of the respondents expressed uncertainty, suggesting a high level of confidence in their views. Overall, the results highlight a widespread recognition of the benefits of technology in enhancing the e-learning experience among students.

Question 9

Do you know what e-learning strategies are?

a. *Yes*
b. *No*

Options	Number	Percentage
Yes	13	43.3%
No	17	56.7%
Total	30	100%

Table 8 Students' knowledge of e-learning strategies.

Analysis of the answers reveals that the majority (56.7%) of students indicated that they do not know what e-learning strategies are. Conversely, 43.3% of

participants stated that they had an understanding of e-learning strategies. This indicates that there is a relatively equal division among the sample members regarding their knowledge of e-learning strategies. Further investigation may be needed to understand the reasons behind different levels of awareness among participants and to provide appropriate support or education on this topic.

Question 9.1

which one among the following strategies do you know most?

- ***a.*** *Open source*
- ***b.*** *Develop partner ships and networks*
- ***c.*** *Integrate ICT with the whole curriculum*
- ***d.*** *Look at what Resources are available*
- ***e.*** *Evaluate E-learning practice*
- ***f.*** *All the Above*

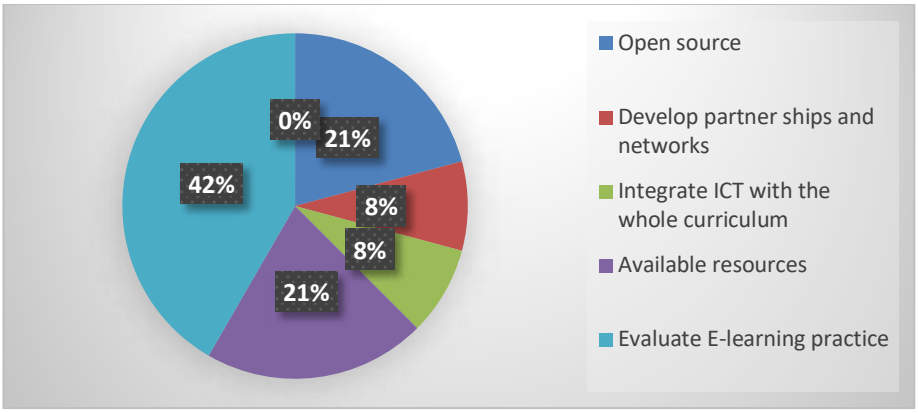

Figure 6 Students' knowledge of e-learning strategies.

According to figure (6) The most recognized e-learning strategy among respondents is "Evaluate E-learning practice" (42%), followed by "Open source" and " available Resources" (both at 21%). Strategies like "Develop partnerships and networks" and "Integrate ICT with the whole curriculum" were mentioned by fewer respondents (8% each). None selected "All the Above."

Question 10

Do e-learning strategies significantly influence education in the 21st century?

a. *Yes, they revolutionize traditional learning methods.*

b. *It depends on the context and implementation.*

c. *No, they merely supplement traditional education.*

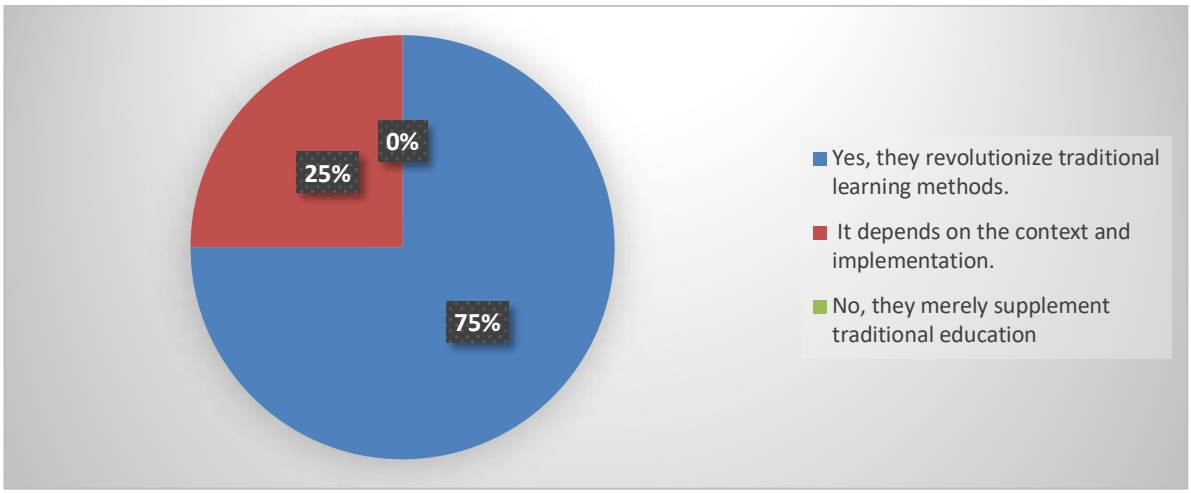

Figure 7 Students' opinion on the impact of e-learning strategies

Figure (7) present that the majority of respondents (58%) believe that e-learning strategies merely supplement traditional education, while 31% view them as revolutionary. A smaller portion (11%) indicated that their influence depends on context and implementation.

Section three: Educational technology

Question 11

Do you know what is Education?

a. *Yes*

b. *No*

Options	Number	Percentage
Yes	28	93.3%
No	02	6.7%
Total	30	100%

Table 9 Students' knowledge of Education

According to table (9) the majority of students (93.3%) are familiar with the concept of education, while a small percentage (6.7%) indicated otherwise.

Question 11.1

If yes, Education is:

a. *Education is the act of teaching and learning, typically in a school or university setting, to help people develop their knowledge and skills.*
b. *Education is the process through which individuals acquire information, develop critical thinking, and cultivate personal growth and social responsibility.*
c. *Education refers to the formal and informal ways in which people learn about the world, gain new abilities, and understand various subjects and concepts.*
d. *All the above.*

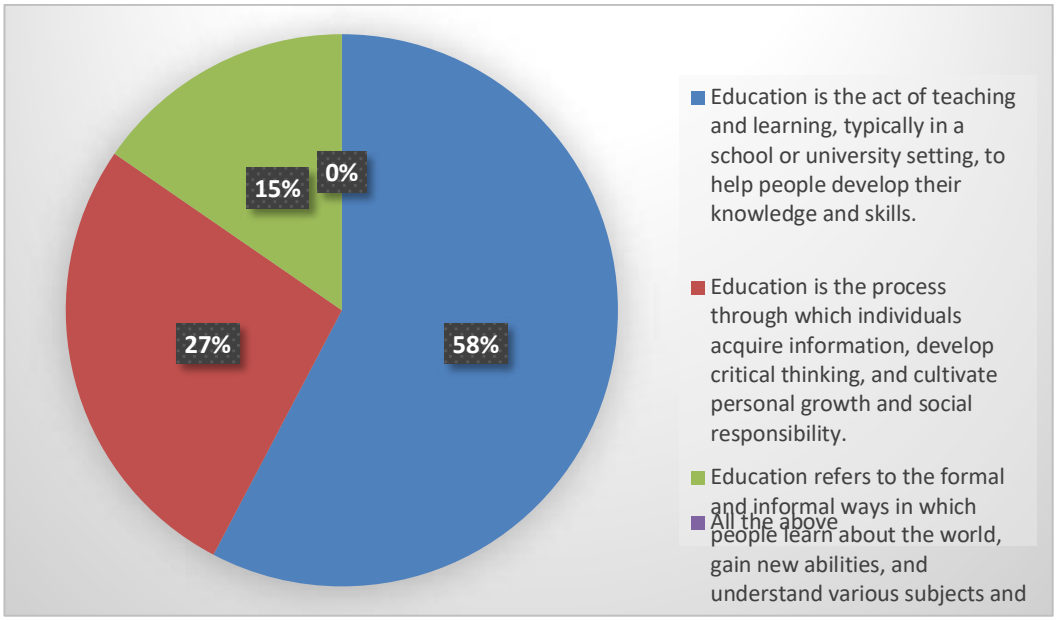

Figure 8 Students' knowledge of Education

Figure (8) present that the majority of the students (58%) perceive education as the act of teaching and learning in formal settings like schools or universities, aimed at developing knowledge and skills. A significant portion (27%) view education as a broader process involving information acquisition, critical thinking development, and personal growth. A smaller percentage (15%) define education as encompassing both formal and informal learning processes. None selected "All the above."

Question 12

Do you know the types of Education?

a. Yes

b. No

Options	Number	Percentage
Yes	22	73.3%
No	08	16.7%
Total	30	100%

Table 10 Students' knowledge about the types of Education

From table (10) it seems that the majority of students (73.3%) are familiar with the types of education, while a notable portion (16.7%) indicated otherwise.

Question 12.1

If yes, which one of The among types do you know most?

a. *Formal education*
b. *Informal education*
c. *Non-formal Education*
d. *Educational technology*
e. *All the above*

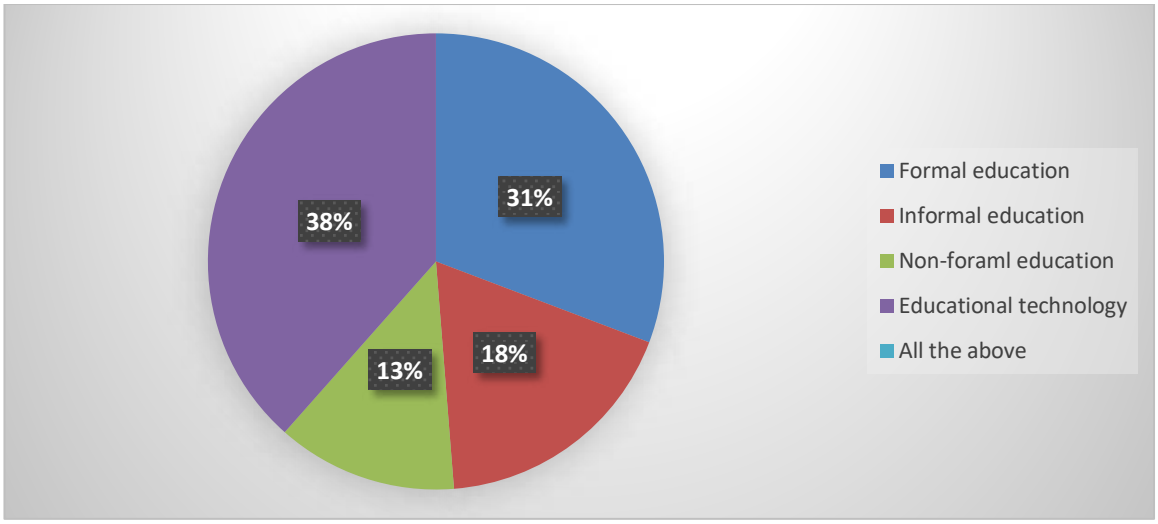

Figure 9 Students' knowledge about the types of Education

Figure (9) present that educational technology emerges as the most recognized type of education (38%), followed closely by formal education (31%). However, informal education and non-formal education garnered less recognition, with 18% and 13% respectively. Notably, none selected "All the above." These findings indicate a stronger familiarity with modern educational approaches like educational technology, potentially reflecting the evolving nature of education in contemporary contexts.

Question 13

Do you know the types of Educational Technology?

a. Yes
b. No

Options	Number	Percentage
Yes	22	71.4%
No	8	28.6%
Total	30	100%

Table 11 Students' knowledge about the types of Educational technology

From table (11) it seems that the majority of student (71.4%) exhibit familiarity with the types of educational technology, indicating a significant level of awareness among the student. However, 28.6% of respondents indicated a lack of knowledge in this area.

Question 13.1

If yes, which one of The among types do you know most?

a. Online Learning Platform.
b. Learning Management System(LMS)
c. Virtual Reality (VR) and Augmented Reality (AR)
d. Gamification
e. Adaptive Learning Systems
f. All the above

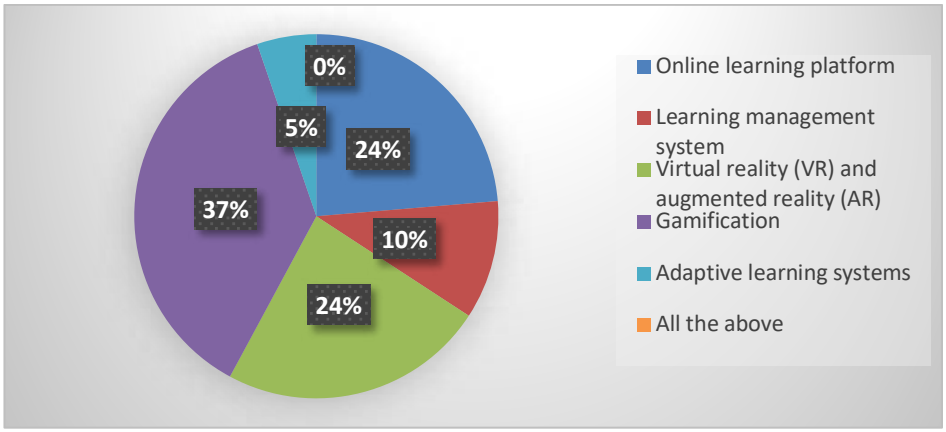

Figure 10 Students' knowledge about the types of Educational technology

According to figure (10) Gamification leads in familiarity among students, with 37% recognizing it. Online Learning Platforms and VR/AR technologies follow, each with 24% familiarity. Learning Management Systems are known by 10% of students, while Adaptive Learning Systems are the least familiar at 5%. No students are familiar with all the listed types.

Question 14

Is technology crucial for enhancing the learning experience in education?

a. Yes

b. No

Options	Number	Percentage
Yes	26	86.7%
No	4	13.3%
Total	30	100%

Table 12 Students' opinions on the necessity of technology in enhancing the learning experience in education.

From table (12) it seems that (86.7) of students believe that technology is crucial for enhancing the learning experience. This indicates a strong consensus on the positive impact of technological tools and platforms in education. In contrast, 13.3% of students do not see technology as essential.

Question 15

Has technology significantly transformed the educational landscape in the 21st century?

a. Yes

b. No

Options	Number	Percentage
Yes	28	93.3%
No	02	6.7%
Total	30	100%

Table 13 Students' opinion on how technology is changing education in the 21st century

According to table (13), 93.3% of student believe technology has significantly transformed education in the 21st century, while 6.7% hold a differing view. This underscores that widespread recognition of technology's impact on teaching and learning.

3.3. Discussion of the Results

After analyzing data, we arrived to the following findings. Section one, (Q1) shows that the participants most of them are males where they represent (83.3%), (Q2) The most (80%) are aged between eighteen and twenty-four years old, (Q3) the majority of the student have been experienced e-learning. Section two, (Q4) It shows that (46%) of students believe that the history of e-learning is completely recent. (Q5) demonstrate that the majority (93.3%) of students know what e-learning is. (Q6) and (Q6.1) show that the majority of students, demonstrating a robust awareness of e-learning via mobile devices, also indicated their knowledge about various types of e-learning, with mobile learning being the most familiar among them. (Q7), (Q7.1) and (Q7.2) It seems that the majority of students are knowledgeable about the advantages and disadvantages of e-learning, with cost-effectiveness being the most recognized advantage. Additionally, most students recognize a combination of disadvantages in e-learning. According to (Q8) the overwhelming majority of students (93%) believe that

technology significantly enhances e-learning. (Q9) and (Q9.1) clarify that (56.7%) of students indicated that they do not know what e-learning strategies are, while "Evaluate E-learning practice" emerges as the most recognized e-learning strategy among respondents. (Q10) present that the majority of respondents (58%) believe that e-learning strategies merely supplement traditional education. Section three. (11) and (Q11.1) indicate that (93.3%) of students are familiar with the concept of education, perceiving it as the act of teaching and learning in formal settings like schools or universities aimed at developing knowledge and skills (58%). (Q12) and (Q12.1) demonstrate that a significant portion of students (73.3%) are familiar with the types of education, with educational technology emerging as the most recognized type (38%). (Q13) and (Q13.1) clarify that (71.4%) of student exhibit familiarity with the types of educational technology. Among these, gamification leads in recognition, with (37%)of students recognizing it. (Q14) indicate that (86.7) of students believe that technology is crucial for enhancing the learning experience. (Q15) shows that (93.3%) of student believe technology has significantly transformed education in the 21st century.

Conclusion

In conclusion, our hypothesis suggesting that improving digital skills and proficiency in e-learning within academia would lead to positive outcomes in education seems to hold true. By providing teachers and students with the necessary abilities to effectively use e-learning tools, we anticipate a significant improvement in the educational process. This approach ensures that e-learning becomes more accessible and beneficial for everyone involved. Ultimately, fostering a culture of digital literacy and competence within academia can lead to a more effective and inclusive e-learning environment, ultimately enhancing the overall quality of education.

General Conclusion

This dissertation explored the evolution and impact of e-learning and educational technology on modern education. In the first chapter, we examined the future of e-learning, its historical development, various types, and their respective advantages and disadvantages. The chapter also highlighted the strong relationship between technology and e-learning, showcasing how digital advancements have revolutionized educational practices. We discussed strategies such as adaptive learning and gamification, emphasizing their positive effects on educational outcomes. The second chapter expanded on different types of education, including traditional, online, and hybrid models. It covered various educational technologies and their transformative roles in the 21st century. Innovations like AI, virtual reality, and big data have significantly reshaped teaching and learning, offering personalized, accessible, and interactive educational experiences. The objective of this study is to investigate how e-learning has transformed education in the 21st century, focusing on its accessibility, effectiveness, and benefits for both educators and learners.

The study aims to provide insights for enhancing e-learning techniques to foster a more inclusive and responsive learning environment. Ultimately, it seeks to contribute valuable knowledge to improve the overall quality and accessibility of education in the digital age.

The study sample consists of thirty (30) third-year LMD (instrumentation) students from the academic year 2023/2024 at the Department of Electronics and Communication, University of Kasdi Merbah Ouargla. These students were selected due to their experience with online and distance learning during the coronavirus pandemic, using platforms such as Zoom and Moodle. The analysis of the questionnaire in the third chapter supports the hypothesis that improving digital skills and proficiency in e-learning within academia leads to positive educational outcomes. By equipping teachers and students with the necessary abilities to effectively use e-learning tools, there is an anticipated improvement in the educational process, making e-learning more accessible and beneficial for all involved. Cultivating a culture of digital literacy and competency within academia ultimately enhances the overall quality of education. The analysis of the questionnaire in the third chapter supports the hypothesis that improving digital skills and proficiency in e-learning within academia leads to positive

educational outcomes. By equipping teachers and students with the necessary abilities to effectively use e-learning tools, there is an anticipated improvement in the educational process, making e-learning more accessible and beneficial for all involved. Cultivating a culture of digital literacy and competency within academia ultimately enhances the overall quality of education.

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Appendices

Students' Questionnaire

Dear Students

You are kindly requested to answer this questionnaire. Our aim from this study is to investigate EFL learners' difficulties in writing academic research paper.

Your answers would be a great help to our research.

Please put (x/√) in the appropriate box (es) or give a full answer(s) on the broken lines.

May I Thank you in advance for your cooperation.

Miss **Chaib Meriem**

Department of letters and English Language

Faculty of letters and Languages

Kasdi Merbah University Ouargla

Section one: Background Information

Question (1)

Gender:

c. *Male* ☐
d. *Female* ☐

Question (2)

Age:

d. *Between 18-24* ☐
e. *Between 24-30* ☐
f. *Over 30* ☐

Question 3

Have you ever experienced e-learning?

c. *Yes* ☐
d. *No* ☐

Section two: E-learning

Question 4

To what extent do you believe e-learning is a recent phenomenon or has historical roots?

d. *Completely recent* ☐
e. *Has some historical roots* ☐
f. *A well –established phenomenon with long historical roots* ☐

Question 5

Do you know what e-learning is?

c. *Yes* ☐
d. *No* ☐

Question 5.1

If yes, E-learning is:

f. *E-learning refers to the use of electronic technologies, primarily the internet, to facilitate learning and training. It encompasses a wide range of activities, from online courses and virtual classrooms.* ☐
g. *E-learning is a form of distance education that enables learners to access educational materials and interact with instructors, without the constraints of time and location.* ☐
h. *E-learning is a mode of learning that leverages digital tools and resources to deliver educational experiences that are flexible, interactive, and personalized. It allows learners to engage with content at their own pace, using a variety of multimedia formats, including text, video, audio, and interactive simulations* ☐
i. *E-learning is increasingly becoming a ubiquitous feature of education and training across various sectors, including higher education, corporate training, and lifelong learning. It offers opportunities for cost-effective and scalable learning solutions, as well as access to expertise and resources from around the world.* ☐
j. *All the above* ☐

Question 6

Do you know what are the types of e-learning are?

c. *Yes* ☐
d. *No* ☐

Question 6.1

If yes, which one of The among types do you know most?

f. *Blended learning* ☐
g. *Asynchronous learning* ☐
h. *Synchronous learning* ☐
i. *Mobile Learning* ☐
j. *All the above* ☐

Question 7

Do you know the advantages and disadvantages of e-learning?

c. *Yes* ☐
d. *No* ☐

Question 7.1

If yes, which one among the following advantages do you know most?

f. *Flexibility* ☐
g. *Accessibility* ☐
h. *Cost effectiveness* ☐
i. *Scalability* ☐
j. *All the above* ☐

Question 7.2

which one among the following disadvantages do you know most?

e. *Digital divide* ☐
f. *Self -motivation and discipline* ☐
g. *Isolation* ☐
h. *All the above* ☐

Question 8

Does technology enhance e-learning?

e. *Yes, significantly.* ☐
f. *No, it hampers effectiveness.* ☐
g. *It varies based on implementation.* ☐
h. *Unsure, need more experience.* ☐

Question 9

Do you know what e-learning strategies are?

c. Yes ☐
d. No ☐

Question 9.1

which one among the following strategies do you know most?

g. *Open source* ☐
h. *Develop partnerships and networks* ☐
i. *Integrate ICT with the whole curriculum.* ☐
j. *Look at what Resources are available.* ☐
k. *Evaluate E-learning practice.* ☐
l. *All the Above* ☐

Question 10

Do e-learning strategies significantly influence education in the 21st century?

d. *Yes, they revolutionize traditional learning methods.* ☐
e. *It depends on the context and implementation.* ☐
f. *No, they merely supplement traditional education.* ☐

Section three: Educational technology

Question 11

Do you know what education is?

c. *Yes* ☐
d. *No* ☐

Question 11.1

If yes, Education is:

e. *Education is the act of teaching and learning, typically in a school or university setting, to help people develop their knowledge and skills.* ☐
f. *Education is the process through which individuals acquire information, develop critical thinking, and cultivate personal growth and social responsibility.* ☐
g. *Education refers to the formal and informal ways in which people learn about the world, gain new abilities, and understand various subjects and concepts.* ☐
h. *All the above.* ☐

Question 12

Do you know the types of Education?

c. *Yes* ☐
d. *No* ☐

Question 12.1

If yes, which one of The among types do you know most?

f. *Formal education* ☐
g. *Informal education* ☐
h. *Non-formal Education* ☐
i. *Educational technology* ☐
j. *All the above* ☐

Question 13

Do you know the types of Educational Technology?

c. *Yes* ☐
d. *No* ☐

Question 13.1

If yes, which one of The among types do you know most?

g. *Online Learning Platform.* ☐
h. *Learning Management System(LMS)* ☐
i. *Virtual Reality (VR) and Augmented Reality (AR)* ☐
j. *Gamification* ☐
k. *Adaptive Learning Systems* ☐
l. *All the above* ☐

Question 14

Is technology crucial for enhancing the learning experience in education?

c. *Yes* ☐
d. *No* ☐

Question 15

Has technology significantly transformed the educational landscape in the 21st century?

c. *Yes* ☐
d. *No* ☐

ملخص

تستعرض هذه الدراسة تأثير التكنولوجيا على التعليم في القرن الحادي والعشرين، مع التركيز على التعلم الإلكتروني. تحلل الدراسة أنواع التعلم الإلكتروني المختلفة، مثل الدورات غير المتزامنة عبر الإنترنت، والفصول الدراسية المتزامنة، والتعلم المدمج، وتبحث في كيفية تأثير التكنولوجيا على ممارسات التعليم والتعلم. كما تقيم كيفية تعزيز التكنولوجيا للوصول الديمقراطي إلى التعليم، وزيادة مشاركة المتعلمين، وتقديم تجارب تعلم مخصصة. تستعرض الدراسة أيضاً دور التقنيات الناشئة مثل الذكاء الاصطناعي، والواقع الافتراضي، وأنظمة التعلم التكيفية في تغيير مشهد التعليم. بالإضافة إلى ذلك، تناقش التحديات والفرص المرتبطة بدمج التكنولوجيا، مثل قضايا المساواة الرقمية وتطوير المهارات المهنية للمعلمين. تهدف الدراسة إلى تقديم رؤى حول كيفية استمرار تطور التعلم الإلكتروني وتقديم فرص تعليمية متنوعة للمتعلمين في العصر الرقمي.

résumé

Cette étude se penche sur l'impact profond de la technologie sur l'éducation au 21e siècle, en mettant l'accent sur l'apprentissage en ligne. Elle analyse comment la technologie modifie les pratiques pédagogiques en examinant les différentes formes d'apprentissage en ligne, telles que les cours asynchrones, les classes virtuelles synchrones et les programmes d'apprentissage mixte. L'étude évalue également l'effet de la technologie sur la démocratisation de l'accès à l'éducation, l'engagement des apprenants, et la personnalisation des expériences d'apprentissage. En outre, elle explore le rôle des nouvelles technologies, comme l'intelligence artificielle, la réalité virtuelle et les systèmes d'apprentissage adaptatif, dans la transformation de l'éducation. Les défis et opportunités liés à l'intégration de la technologie, notamment l'égalité numérique et la formation professionnelle des enseignants, sont aussi abordés. Cette étude anticipe que l'apprentissage en ligne continuera de se développer, offrant aux apprenants une gamme variée de possibilités éducatives. En soulignant ces évolutions technologiques, elle vise à informer les acteurs de l'éducation des opportunités et défis que présente l'apprentissage en ligne à l'ère numérique.