

IMPACT OF INFORMATION TECHNOLOGY AND MACHINE LEARNING ON DIGITAL TEACHING, LEARNING, AND HRM

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ABSTRACT

The emergence of new and advanced technologies has sparked rapid transformations in various spheres of life, particularly in the realm of education. The growing utilization of machine learning and information technology in educational settings is disrupting traditional teaching and learning methods. This article offers a comprehensive exploration of the influence of machine learning and information technology on digital education, learning methodologies, and human resource management within the educational sector. As technology continues to permeate everyday life, it profoundly affects all areas of the curriculum. The widespread availability of global communication through technology enables immediate access to copious amounts of information, thereby challenging learners' assimilation and evaluation abilities. With increasing accessibility of IT at home, work, and educational institutions, learning becomes an ongoing pursuit that necessitates continual assessment of the learning process itself. This paper delves into the obstacles and prospects arising from the integration of information technology in education, while also presenting insights into leveraging this transformative process for enhanced efficacy in teaching, learning, and HR management.

Keywords: Technology, Digital Teaching, Digital Learning, Education, Machine Learning, Human Resource

1. INTRODUCTION

The impact of information technology and machine learning on digital teaching, learning, and human resource management (HRM) is a topic of great significance. Education and technology are deeply intertwined, with education driving technological advancements and technology revolutionizing the way we educate. Information technology, including computers and peripheral equipment, has experienced exponential growth in service industries, necessitating a proactive response to the challenges of the information age. Technology has transformed education by enabling virtual classrooms and empowering students to take an active role in their learning process. However, integrating technology into teaching remains a challenge for many educators (Fattahi Marnani & Cuocci, 2022; Rasekh Eslami & Zohoor, 2023). Despite these hurdles, the internet has opened up new opportunities for global connectivity, knowledge sharing, and learning across all age groups. Moreover, the adoption of educational technology can contribute to environmental sustainability through reduced paper usage (Anbari et al., 2020; Kamranfar et al., 2023).

Nevertheless, it is important to acknowledge the digital divide that exists in terms of access to educational technology. While elite institutions benefit from cutting-edge technology, remote areas still heavily rely on traditional teaching methods. Bridging this technology gap holds immense potential for enhancing education delivery, expanding access to knowledge sources, and facilitating quality distance learning in higher education (Khorsandi et al. 2022).

This paper primarily focuses on examining the positive and negative impacts of information technology and the internet on HRM. It explores how these technologies can be leveraged for talent acquisition, motivation, and leadership. Additionally, the paper discusses anticipated outcomes and future possibilities for managing and harnessing the inevitable changes brought about by the use of information technology and the internet in HRM.

2. THE USE OF INFORMATION TECHNOLOGY (IT) IN THE EDUCATIONAL SECTOR

The utilization of Information Technology (IT) in the educational sector has proven to be highly significant. It has revolutionized teaching methods and enhanced learning capabilities through the integration of audio-visual education. This has led to a vast expansion of learning resources available to students (Zohoor & Eslami, 2021). IT encourages learners to view computers as essential tools for all aspects of their studies, enabling them to utilize multimedia technologies to communicate ideas and organize information effectively.

One of the key advantages of IT in education is the immediacy it brings. With the aid of computers and web networks, students can access education anytime and anywhere. Traditional modes of work and life have seamlessly incorporated IT without major disruptions. Collaborative learning has also been made easier through IT, allowing groups to study and teach together online. Educational broadcasting has benefitted from postal systems, telephones, and recording/playback systems. However, it is important to acknowledge that while the

internet and its websites are familiar to many students and educators, accessibility remains a challenge for those lacking basic means for subsistence.

Audio-visual education has witnessed substantial growth, aligning with advancements in technology and learning theories. Research indicates that the use of audio-visual aids in education offers several benefits, such as facilitating the perception of critical features, organizing materials in a systematic manner, and engaging multiple sensory modalities simultaneously.

Online libraries have emerged as valuable resources thanks to the internet. The IT curriculum actively encourages learners to employ computers and multimedia technologies to effectively communicate ideas, structure information, and create multidimensional documents (Cuocci and Fattahi Marnani, 2022).

IT has had a transformative impact on the lives of disabled children, providing various software and techniques for inclusive education. For instance, early language stimulation through sign language has proven to be academically beneficial for deaf children, enabling them to achieve alongside their hearing peers.

Integrating IT into teaching practices is crucial for ensuring quality in the educational system. Students must become proficient in IT as future job prospects will rely heavily on technological proficiency. The utilization of IT in teaching also improves overall quality and effectiveness.

Machine learning has emerged as an invaluable tool within the educational sector. Predictive modeling, for instance, enables the analysis of student data to identify at-risk students who may require additional support. Adaptive learning, another application of machine learning, utilizes algorithms to create personalized learning experiences that cater to each student's unique needs and learning style (Mahdiani et al., 2015; Dehghani and Larijani, 2020; Dehghani and Larijani, 2023; Roudini et al., 2020; Alipour & Bastani, 2023). These studies highlight the potential of machine learning to optimize processes and enhance outcomes across various fields, including education. By harnessing machine learning techniques and algorithms (Lai et al., 2023; Jebellat et al., 2023), educators and administrators can gain valuable insights into student behavior and preferences, customize instruction to individual needs, and ultimately improve student outcomes.

3. HAS THE DELIVERY SYSTEM OF EDUCATION UNDERGONE ANY CHANGES AS A RESULT OF INFORMATION TECHNOLOGY?

The delivery system of education has undergone significant changes as a result of information technology (IT). Technology has influenced the structure of organizations and managerial decision-making, providing more flexibility in choosing feasible structures (Lucey; Wilkinson). Computers have become an integral part of people's lives, and their impact on education is evident.

In traditional schools, teaching aids like slide projectors, overhead projectors, and LCD projectors are commonly used to deliver knowledge and information. However, distance education has revolutionized the delivery of education in remote areas through various tools such as audio-visual tapes, radio and TV broadcasts, satellite teleconferencing, floppy disks, CD-ROMs, and networking technologies like EARNET, INTERNET, and direct-to-home (DTH) (Wilkinson).

With internet access, learners now have access to an unrestricted pool of knowledge through Web TV, creating virtual classrooms. Broadcast TV enables professionals, emeritus professors, and functional specialists to interact directly with large numbers of learners. Multimedia computers provide one-to-one training, allowing learners to control the pace of instruction according to their own capacity and preferences (Wilkinson).

Computer-based learning offers mature students in the management field an opportunity for self-growth, allowing them to appraise their achievements in the learning process. Teachers can focus on development and research-related activities, as routine tasks such as tasking, drill, practice, and information sharing are automated (Azimi Asmaroud, 2022; Zarei & Dobakhti, 2023). This new system reduces dependence on conventional infrastructure and eliminates time wasted on assembling in a physical classroom (Lucey).

The use of IT tools, including computers, CDs, case studies, workshops, project work, and business games, enhances conceptual learning and develops practical skills required by prospective managers, such as conceptual, behavioral, analytical, and administrative abilities (Niyafard et al., 2023).

Overall, the integration of IT in education has transformed the delivery system, making it more flexible, accessible, and interactive. It has expanded the range of resources available to learners and facilitated personalized learning experiences. With the continuous advancements in technology, the delivery system of education will continue to evolve, providing new opportunities for learners and educators alike.

4. THE PURPOSE OF EDUCATION IN THE CONTEXT OF INFORMATION TECHNOLOGY HAS UNDERGONE SIGNIFICANT CHANGES

The purpose of education has experienced significant changes in the context of information technology. These changes have not only impacted the methods and potential of education but also raised questions about its nature and objectives. While opinions on the extent and desirability of these changes differ, it is undeniable that information technology has become a driving force of transformation in educational institutions.

Many educational stakeholders, including schools, technology developers, and researchers, have embraced the use of technology to enhance education (Asmaroud et al., 2015). However, it is important to recognize that the

integration of external resources through technology fundamentally alters the functioning of educational systems. This shift in resources and attitudes towards their utilization has reshaped the knowledge and skills students need to acquire. The concept of what one "needs to know" has evolved from being static to becoming revisionary, creative, personal, and pluralistic.

The purpose of educational technology is subjective and open to interpretation among educators. Some perceive it as a powerful tool that enables students to achieve more than ever before, while others view it as a means to efficiently acquire traditional knowledge and skills. Education is increasingly seen as a dynamic process involving the creation, preservation, integration, transmission, and application of knowledge. The very nature of knowledge itself has transformed, reflecting a shift towards a more adaptable, creative, and individualized perspective.

The future of education is not predetermined solely by modern information technology. Instead, it depends on how we consciously incorporate technology into the educational process. It requires careful consideration and deliberate construction of the role and place of technology within education. By effectively leveraging information technology, we can shape the future of education to ensure it remains relevant, innovative, and responsive to the needs of learners in an evolving world.

5. EDUCATION'S POTENTIAL UNLEASHED BY INFORMATION TECHNOLOGY

The potential of education unleashed by information technology has yet to receive adequate attention, particularly concerning its application in organizing and managing the learning environment. However, information technology (IT) has become an integral part of our daily lives, offering vast amounts of information through web pages and other devices that gather and disseminate knowledge across various aspects of society.

In the field of education, IT brings added value to traditional teaching methods, although ongoing debates persist regarding the effectiveness of e-learning applications. Nonetheless, students increasingly request such approaches as a supplementary tool for delivering learning materials, and faculty members require support to effectively utilize technology for the benefit of their students. To ensure that both students and faculty have access to e-learning tools, educational institutions should designate an e-learning champion possessing strong interpersonal skills to facilitate and encourage faculty adaptation.

To enhance the quality of e-learning, it is crucial to establish well-defined learning objectives for learning materials and incorporate peer review processes to ensure content validity, accuracy, currency, evidence-based data utilization, and adherence to best practices (Moshtaghi Largani & Lee, 2023). This necessitates outlining strategies and recommendations to improve the overall quality of e-learning. Additionally, traditional examination schemes can be enriched through the integration of IT, while the internet offers innovative approaches to assessment.

Looking ahead, future trends in IT will focus on enhancing uptake and accessibility through advancements in technology, encompassing both hardware and software. The utilization of Web 2.0 technology holds significant promise, exemplified by initiatives like the one-laptop-per-child project, which demonstrates how simple technology can overcome barriers to learning. Given that IT is constantly evolving, users must remain adaptable to navigate the ever-changing landscape, ensuring that the excitement and possibilities of IT continue to shape the future of education.

6. EDUCATION IN A DYNAMIC WORLD OF CONSTANT CHANGE

In the rapidly evolving and complex world of today, humanity faces some of its most intricate challenges. As the primary catalyst for development as well as a significant risk factor, humans have amassed substantial institutional, technological, and intellectual potential over centuries of adaptation to natural and social changes (Laube and Sasani, 2020). This has led to a vast global potential. However, the artificial environment created by humans has resulted in a fundamental and equally destructive misalignment between human existence and the immense capabilities and powers of the modern world.

While education and teaching are often used interchangeably, they yield differing outcomes. Teaching primarily focuses on the transfer of specific and limited knowledge and skills through an algorithmic and instructive method. Despite the integration of modern information technology, this approach has not effectively unleashed the talents and aptitudes of students. Consequently, traditional teaching methods as a means of knowledge transmission are reaching their limits. It is therefore imperative to explore new solutions.

In contrast to traditional teaching, education strives to cultivate "knowledge as an instrument" and construct a comprehensive understanding of the world. This fosters a versatile mindset capable of adeptly addressing the non-classical complexities of the world. Such knowledge enables individuals to perceive themselves as integral parts of the environment, fostering a harmonious relationship between nature and humanity, while also recognizing science as a tool for achieving harmony. This new educational paradigm can be characterized as a logically interconnected triad—navigating from a holistic world to holistic knowledge, and through it, to the development of a holistic personality.

The current socio-economic landscape presents an opportunity to resolve the enduring debate between general education and vocational training. The emphasis on knowledge and expertise derived from quality education, leading to success in life, is gradually giving way to the cultivation of individual creative potential. Education is gaining prominence as it harnesses an individual's cultural and intellectual potential, surpassing the traditional focus on physical work abilities. Telecommunication technologies based on tele-networks and intelligent computer systems are creating new prospects for both educators and learners. The infosphere, the planet's emerging infrastructure, encompasses these networks and systems, enveloping civilization as a distinct world and community. The architects of the infosphere promote a new mindset, ethical standards, and a transformed culture of comprehension. The progression of the infosphere necessitates confronting the prospect of super-biological and potentially super-psychological transformations in humans (Nikraftar et al., 2021).

Computer technologies facilitate educational opportunities and aid individuals in refining their perceptions. They also enable millions of people worldwide to engage with the world's masterpieces through vivid depictions of architectural works, sculptures, and paintings, accompanied by thematically organized texts and beautiful music. This enhances emotional engagement, nurtures artistic sensibilities, and deepens understanding of culture, arts, and human history. These advantages are poised to be leveraged in the education of the future.

7. THE PRESENT IMPACT OF INFORMATION TECHNOLOGY AND THE INTERNET

The impact of information technology and the internet, particularly in the realm of machine learning, has been profound in recent years. In 2008, the global number of internet users surpassed 400 million and was predicted to exceed one billion by 2010 (State of the Internet, 2009). This increasing connectivity has had significant implications for companies seeking to recruit, develop, and retain personnel in a competitive workforce market (Izadpanah et al., 2020; Khorsandi & Khorsandi, 2022).

While communication remains one of the primary uses of the internet, its influence on people's daily lives remains a topic of debate. Some argue that the internet enhances the frequency and quality of interpersonal communications, while others raise concerns about the potential weakening of social ties due to reduced face-to-face interaction.

Over the past two decades, the internet has become one of the most popular and indispensable technological innovations, with billions of users worldwide. Access to powerful search engines like Google, MSN, or Yahoo enables users to find specific information within seconds. Moreover, the internet provides opportunities to access educational and entertaining websites, facilitating continuous learning and the expansion of general intelligence. Students benefit greatly from electronic libraries, e-book catalogs, scientific databases, academic works, news sources, and educational websites available online.

Furthermore, the internet facilitates interpersonal and intercultural communication through various tools such as instant messaging, emails, online chat rooms, voice and video chats, and more. It brings people closer together, fostering friendships among individuals with shared interests or from different cultures around the world. Additionally, the internet serves as an effective tool for job searching, hotel and ticket reservations, financial transactions, advertising, freelance work, and the provision of various social services online (Talebzadeh, 2012).

While issues such as spamming, computer viruses, personal information theft, and internet addiction pose challenges, the benefits of the internet outweigh its drawbacks. It opens doors to new opportunities in entertainment, education, and business. Therefore, it is crucial to recognize that modern internet technologies bring about more positive changes and opportunities than harm. The development of the internet has transformed various aspects of life, making it an essential tool for individuals and society as a whole.

8. THE CONTEMPORARY APPLICATION OF THE INTERNET IN THE EDUCATION INDUSTRY

The application of the internet in the education industry has greatly evolved with the advent of machine learning and advanced technology. The availability of high-speed connections and web applications has revolutionized the way people access educational material. Today, the internet provides easy access to a wide range of educational resources, from pre-school to post-doctoral studies, including virtual universities and scholarly literature accessible through tools like Google Scholar (Gopal & Gagnon, 1995).

One of the significant benefits of the internet in education is the facilitation of collaborative work. Collaborative software allows for the low-cost and instant sharing of ideas, knowledge, and skills among individuals or groups. This not only enables efficient communication but also expands the reach of collaboration. Examples of successful collaborations include the development of free software such as Linux, Mozilla Firefox, and OpenOffice.org. Online chat rooms and instant messaging systems further enhance communication among colleagues, enabling faster and more efficient exchanges of messages compared to traditional email communication.

Version control systems have also transformed collaborative work by allowing teams to work on shared documents without the risk of accidental overwriting. Additionally, the internet enables the sharing of calendars, documents, and other information across various fields, ranging from scientific research and software development to conference planning, political activism, and creative writing (Cuocci et al., 2023). This has led to

increased social and political collaboration as computer literacy and internet access continue to grow, empowering individuals to work together in new and innovative ways.

Moreover, the internet has facilitated remote access to computers and information stores regardless of geographical location. This has opened up possibilities for remote working, collaboration, and information sharing in various industries. For instance, an accountant can now remotely audit the books of a company located in another country using servers maintained by IT specialists in yet another country. Office workers can also access their office computers and files through secure Virtual Private Network (VPN) connections, enabling them to work remotely with complete access to their data.

While some of these capabilities existed before the widespread use of the internet, the high cost of private leased lines made them impractical for many. The internet has democratized access to information and collaboration, making it more accessible and cost-effective for individuals and organizations in the education industry.

In conclusion, the contemporary application of the internet in the education industry, with a focus on machine learning, has revolutionized access to educational resources and facilitated collaborative work. It has transformed the way people learn, collaborate, and share information, making education more accessible and efficient than ever before. With continued advancements in technology, the internet will continue to play a crucial role in shaping the future of education.

9. THE UTILIZATION OF THE INTERNET FOR EMPLOYEE GROWTH AND DEVELOPMENT

The internet plays a crucial role in facilitating employee growth and development, especially in the context of machine learning (Tehrani, 2023). Once basic needs are met, individuals are motivated to acquire new knowledge and enhance their skills, which is essential for both personal and organizational success.

Internet-based technology offers a wide range of opportunities for individuals to obtain new knowledge and skills. From an organizational perspective, it provides quick access to the latest scientific and technological innovations from other companies and research institutions (Jeraman-Blazic, 1996). For individuals, the internet serves as an extensive searchable database of web pages, newsgroups, mailing lists, online courses, forums, and more.

Information Technology (IT) has the power to extend educational opportunities to previously underserved individuals and communities. It enables asynchronous learning, allowing learners to access online course materials at their convenience and from anywhere, without being restricted by time or location. Moreover, certain types of IT enable synchronous learning, where instruction can be simultaneously received by multiple learners who are geographically dispersed. IT also provides access to remote learning resources, including unlimited learning materials in almost every subject and media, mentors, experts, researchers, professionals, business leaders, and peers worldwide (Heidari et al., 2023). This is particularly significant for schools with limited and outdated library resources in developing countries and certain developed countries.

By leveraging the internet, employees can engage in continuous learning, stay updated on industry trends, and acquire new skills that are relevant to their roles. This not only benefits the individuals themselves but also contributes to the growth and development of organizations. The internet offers a vast array of learning resources and platforms that empower employees to expand their knowledge base and enhance their skill sets.

However, it is essential to recognize that excessive reliance on technology can lead to anxiety, burnout, and a negative impact on an individual's quality of life. Therefore, organizations must promote a healthy work-life balance and encourage employees to take breaks from technology to prevent burnout and enhance their well-being (Karami et al, 2019; Fattahi Marnani & Cuocci, 2022; Sabzevari and Gramie, 2016; Sabzevari et al, 2022). By leveraging the internet, employees can engage in continuous learning, stay updated on industry trends, and acquire new skills that are relevant to their roles. This benefits not only the individuals themselves but also contributes to the growth and development of organizations. The internet offers a vast array of learning resources and platforms that empower employees to expand their knowledge base and enhance their skill sets.

In conclusion, the utilization of the internet for employee growth and development, with a focus on machine learning, provides unparalleled opportunities for individuals and organizations. It enables access to the latest information, facilitates asynchronous and synchronous learning, and connects learners with a global network of resources and expertise. Embracing internet-based technologies is crucial for fostering a culture of continuous learning and driving personal and organizational success in today's rapidly evolving digital landscape.

10. BENEFITS OF INFORMATION TECHNOLOGY IN EDUCATION: THE CRUCIAL ROLE OF HUMAN RESOURCE MANAGEMENT

In today's rapidly evolving digital landscape, the integration of Information Technology (IT) in the educational sector has transformed the way students learn and educators teach. As educational institutions embrace

technological advancements, the role of Human Resource Management (HRM) becomes increasingly vital (Ibrahim and Sasani, 2021). HRM plays a crucial role in ensuring the effective utilization of IT tools and technologies for the benefit of both students and educators. This essay will explore the various aspects of HRM's role in the educational sector, highlighting its significance in training and development, recruitment and selection, policy development, fostering innovation, and curriculum integration.

One of HRM's essential functions in the educational sector is to identify and address the IT training needs of educators. HRM recognizes that educators must be proficient in using IT tools and technologies effectively to enhance the learning experience for students. By organizing workshops, seminars, and training programs, HRM provides educators with the necessary skills and knowledge to utilize IT resources optimally. This empowers educators to create engaging and interactive learning environments, incorporating innovative teaching methods that cater to the diverse needs of students in the digital age.

HRM plays a pivotal role in recruiting and selecting IT professionals who can support the implementation and maintenance of IT infrastructure in educational institutions. With the increasing complexity of IT systems, HRM ensures that qualified individuals, such as network administrators and software developers, are hired. These professionals provide technical support, ensuring the smooth functioning of IT systems and addressing any technical issues that may arise. By assembling a competent IT team, HRM enables educators to focus on their core responsibilities, confident in the knowledge that their IT needs will be met efficiently.

HRM also contributes significantly to the development of policies and guidelines related to the ethical and responsible use of IT in education. With data privacy and security concerns on the rise, HRM establishes protocols to safeguard sensitive information, ensuring compliance with copyright laws when utilizing digital resources. Furthermore, HRM promotes responsible online behavior among students and educators, creating a safe and respectful digital learning environment. By providing clear guidelines and policies, HRM ensures that IT is utilized in an ethical and responsible manner, fostering a sense of trust and security within educational institutions.

HRM plays a crucial role in fostering a culture of continuous learning and innovation through IT. By encouraging educators to embrace new technologies and explore innovative teaching methods, HRM contributes to a dynamic learning environment. HRM facilitates collaboration and knowledge sharing by creating communities of practice and providing professional development opportunities. Moreover, by recognizing and rewarding innovative uses of IT in teaching, HRM motivates educators to continually improve their skills and incorporate new technologies into their teaching practices (Niu et al., 2023). HRM collaborates with curriculum developers and instructional designers to ensure that IT skills and competencies are integrated into the curriculum, preparing students for the digital future.

The integration of Information Technology (IT) in education has brought about significant transformations in the learning process. Human Resource Management (HRM) plays a critical role in maximizing the benefits of IT tools and technologies within educational institutions. By focusing on training and development, recruitment and selection, policy development, fostering innovation, and curriculum integration, HRM ensures that educators and students can effectively utilize IT resources to enhance teaching and learning experiences. In this digital age, HRM's role in the educational sector becomes increasingly indispensable, driving educational institutions towards success and preparing students for the challenges of the technological era.

11. CONCLUSION AND FUTURE WORKS

The focus of this paper was to examine the impact of Information Technology (IT) on teaching, learning, human resource management, and new ways of working with a specific emphasis on machine learning. While the scope of this paper was broad, it did not cover all possible influences of IT on the workplace market and employee management. Compared to traditional modes of information sharing, IT tools offered significant advantages. Education and technology were closely intertwined as education fuels technology and vice versa. As a result, IT had brought about changes in the methods, purposes, and perceived potential of education. The future of education is not solely determined by modern information technologies; rather, it depends on how we utilize them effectively.

Despite this, faculty members still require support to use these technologies appropriately for the benefit of their students. It is the responsibility of educational institutions to provide such support, including the appointment of an e-learning champion with excellent interpersonal skills to encourage faculty change. This paper advocates for open access to e-learning materials, platforms, and programs. Furthermore, IT can enrich traditional examination schemes and evaluation processes. Computer technologies facilitate educational opportunities and assist individuals in refining their perceptions.

The internet is an invaluable source of information for both students and human resources, providing access to electronic libraries, e-books, catalogs, databases, and more. Incorporating the internet into classrooms and administrative areas enhances modern educational opportunities and enables human resources to use online databases and resources. Machine learning can leverage the vast amount of data generated by the internet to develop intelligent algorithms that can improve education and human resource management.

In conclusion, IT has had a significant impact on education, human resource management, and new ways of working, particularly with the introduction of machine learning. Educational institutions must prioritize providing

faculty members with adequate support to ensure they can use these technologies effectively. Furthermore, open access to e-learning materials, platforms, and programs should be encouraged. Incorporating the internet into classrooms and administrative areas can provide modern educational opportunities and enable human resources to access online databases and resources. The potential of machine learning to improve education and human resource management is vast, and we must explore it further.

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