

## APPLICATIONS OF ARTIFICIAL INTELLIGENCE IN EDUCATION

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### ABSTRACT

School closures affect about 1.2 billion children in 186 countries as a result of the pandemic COVID 19. Many people around the world are concerned about whether online learning will continue to evolve or how it will affect the global education sector. The key benefits of Education 4.0 are related to the digital, virtual, and smart revolution for educators and other stakeholders. Some educators believe that the philosophy of personalized learning involves a lot of work, but that they can still address the specific needs of students. Using this technology, the teacher can teach the students rather than the class. Teachers have used various techniques and tools to promote personalized learning. This leads to better learning outcomes for students and better educational outcomes overall. Digital technology facilitates the work of educators and teachers by giving them the best techniques to make their job easier. Individuals prefer a customized learning methodology. In this area, the role of artificial intelligence is of great importance. AI-centric tools cater to the individual needs of students by enabling greater focus on specific topics through repetition of content and helping students learn at their own pace. In the future, the development of AI will lead to the adaptation of improved learning programs that result in greater gamification and personalization of the learning process. The purpose of this study is to investigate the impact of e-learning through the use of AI and Future Management Tools in learning management system in COVID 19.

**Keywords:** *Artificial Intelligence, Learning 4.0, E learning, e-learning techniques*

### INTRODUCTION

School closures affect about 1.2 billion children in 186 countries as a result of the pandemic COVID 19. Many people around the world are concerned about whether online learning will continue to evolve or how it will affect the global education sector. Following the COVID 19 epidemic, the trend toward online learning has increased significantly (Kilfoil et al. 2019). Yet, the value of e-learning varies significantly across age groups. A well-structured setting is especially important for younger children, as they are easily distracted. Different tools for collaboration and engagement are needed to promote intelligence, personalization, and inclusion. Online education has become a necessity in recent years. The rest of the world is quarantined

due to a terrible pandemic, and most cities have turned into ghost towns. The impact can be seen in primary and secondary schools. Educational institutions have moved from offline to online pedagogy (Estadilla, 2020).

Those institutions that have been reluctant to adopt current technological innovation tools are now poised to do so with the right application of technology. Leading universities around the world are fully digitizing to better meet the pressing needs of the current situation. The epidemic COVID 19 triggered a cascade of events that impacted the entire education world. The growth of specific technologies that are practical in such an environment clearly demonstrates the new paradigm. AI can collaborate with humans by creating useful scenarios, simulations, and learning experiences (Arruda, et al. 2020).

The purpose of this study is to explore the impact of e-learning by using AI and Future management tools in learning management system in COVID 19. A new digital tool has been developed as the platform for e-learning and distance education.

## **BACKGROUND**

Quality education seems to be a clear consideration under Sustainable Development Goal 04, which aims to close the massive budget gap created by the COVID-19 pandemic. The impact of COVID-19 continued to affect a global education system, with 1.58 billion students from preschool through university affected by the impact of the pandemic. The closure of educational institutions for the purpose of social distancing certification has raised new concerns for learners, as has the introduction of e-learning techniques and Industry 4.0. (UN. Org, 2020). In addition, the spread of the pandemic has led to the introduction of new laws and reforms to support educational institutions (Nicola, et al., 2020). To keep pace with the changing landscape, educational institutions must adapt, transform, and adopt AI and Industry 4.0 methodologies (Dwivedi, et al., 2020). Industry 4.0, with its technological advances, is capable of combating the spread of COVID-19 and meeting the unique needs of crisis management (Javaid, et al., 2020). To flatten the infection curve, educational institutions are willing to promote e-learning to support students' learning needs. The use of AI and future management tools in learning management systems will likely complement advanced agile practises while containing the spread of COVID-19 and contributing to preparedness efforts (Murphy, 2020).

In response to increasing health problems, the education system is rapidly adopting e-learning to maintain normalcy in school while supporting distance learning through modern technological advances. E-learning uses electronic technologies to provide access to educational content outside the classroom and facilitate distance learning and interactive sessions (E-Learning NC, 2020).

Prior to COVID-19, the advances of Industry 4.0 and e-learning methods were discussed, with learners assigned to the virtual session. (Muhfahroyin & Susanto, 2018) discovered the benefits of e-learning where online learning and skills are promoted to learners and they become digitally fit to use the current technology. In addition, (A-Fraihat, et al., 2020) advocated technological innovations in education and virtual learning to enable ubiquitous learning without regard to time or place constraints. Monitoring campus traffic and remote work behaviors to enable e-learning and address difficulties in efficiency (Favale, et al., 2020). In addition, the desire for digital learning and the adoption of Industry 4.0 methods facilitate student learning and welcome digital efficiency (Bujang, et al., 2020). E-learning, where the

impact of electronic resources is accompanied by networking and information sharing to accommodate knowledge management, reflects the formalization of educational processes.

### **Alteration in E Learning and Distance Learning in COVID 19**

Digital skills are at the heart of the inevitable retraining of the workforce in the future. Artificial intelligence, the Internet of Things, and machine learning have become new realities that are driving profound changes in the world. To meet the changing global demand based on information and communication technologies, it is imperative to bridge the gap between current and future talent. The ICT sector plays a critical role in supporting the proliferation of great training programs that enhance relevant education and prepare students for the workforce (Hoq, 2020).

The COVID 19 resulted in substantial disruption to the historical education system, affecting approximately 1.6 billion learners in various regions of the world. Approximately 94 percent of the global learner population was affected by school closures and other learning disruptions, 99 percent of which occurred in low- to middle-income countries. COVID 19, a contagious and deadly disease, has a significant impact on the global economy. The global education sector has been shaken by the tragic situation. The outbreak of COVID 19 has led to the temporary closure of various universities and schools in different regions of the world. The prevailing social distance will have a negative impact on many learning opportunities. A large number of educational institutions are forced to consider different options for dealing with difficult situations (Selwyn,2020).

The issue underscores the critical importance of scenario planning for large academic institutions. It reinforces the call for unity and humanity. Moreover, there is an urgent need to protect and save all parties involved in education. The impact of e-learning is the subject of numerous arguments. Flexibility, affordability, lifelong learning, and online pedagogy are some of the arguments. Remote and rural areas can benefit from online learning because it is easily accessible. It is seen as a more cost-effective educational option as it reduces travel costs and the overall cost of learning in school (Altinpulluk, 2019).

AI could provide ample support to e-learning at the time of crisis of COVID 19. A very advanced discipline of digital technology in education is based on personalization of learning. In some ways, personalization is considered an essential component. Digital technology promotes progress in developing personalized solutions based on students' learning problems and knowledge. Three types of systems that have proven to be very useful in corona crises are discussed here. The first systems that are helpful to students, parents, and teachers relate to the navigation of current online resources that are accessible both online and for commercial purposes. The system that helps teachers and gives accurate assignments to students based on their challenges and knowledge in the related subjects. The third system helps students to complete their homework in different subjects (Siripongdee, Pimdee, & Tuntiwongwanich, 2020).

Arshad (2020) claims that digital personalization systems are beneficial to educators, teachers, and parents. Parents and teachers strive to balance various activities such as physical activity, mathematics, and other cultural activities to encourage children's engagement and provide a holistic education. The AI system provides helpful recommendations on what to watch, listen to, or read. Based on the ability diagnosis, the AI system aims to develop further in the field of education. Therefore, Alqahtani & Rajkhan (2020) argue that there is a new digital divide between AI and various digital systems that can enhance human capabilities. It is also

criticized that the personalization and education-oriented system of AI lead to an increase in inequalities. The reason is high quality and expensive services after the pandemic of COVID 19. Teraes, et al. (2020) also criticize that children from disadvantaged backgrounds cannot choose to telework. These AI systems do not care about social status or background, while there are more opportunities to provide this system for less privileged children to thrive in society. Moreover, digital systems and AI systems made by humans are not perfect. COVID 19 is a reminder to improve and learn through the critical mobilization of different tools based on what has been learned in the past. Education 4.0 is based on the belief that promoting smart and intelligent thinking in education is intentional.

The development of contemporary research has shown that the pace between education and the world of students should be maintained in order to achieve a sustainable and secure future. Education 4 uses the unique and distinctive tools and creates an identical atmosphere to ensure that the work experience is identical to the educational experience (Muhammad et al. 2020).

As a result, Education 4.0 is a more hands-on and realistic form of learning that leads to great learning outcomes for students. Education 4.0 recognizes the importance of sustaining a changing world. Personalizing education can help students achieve better learning outcomes. In essence, Education 4 uses a smart system for school management, learning and communication tools, educational software, and other purposes. Education 4 provides a personalized learning experience, promotes better understanding, and allows students to access memorable and professional content (Tarus, Niu, & Yousif, 2017).

### **New AI Algorithm Tool**

With this AI-based system, policymakers can still avert the looming disaster of combining face-to-face learning with e-learning. It not only bends the curve of learning indicators and finds new business opportunities and new business pillars with minimal operational costs and maximum operational excellence.

It uses the conventional e-learning and distance learning techniques to deliver the information and build the required knowledge, with most systems using the measurement of ROK (Return on Knowledge), where all learning management systems use simple formulas to measure the effectiveness and efficiency before learning starts and after learning. Learning 4.0 has addressed this challenge by measuring and managing the learning journey during the course using AI algorithms that analyze eye pupils and facial recognition to determine the learner's current status. In each unit, the system analyzes the result and asks the learner a random question or sets up a random icebreaker game in which the algorithm continues to work on extracting the behavioral skills of the learner itself.

### **Process of algorithm formation:**

1-Defining the goals of the system: during the learning journey, we need to identify the changes and the measurement characteristics. Based on the concentration level "engagement", the environment "distraction level", the use of other components during the learning delivery such as mobile "boundaries", content changes in each chapter according to the learning speed in answering each module question "adaptive content".

2 - Data collection and scenario creation: we started creating scenarios for different learners and grouped them according to learning style, correct answers in each module and learning

adaptations. According to the four learning styles, we could cluster the data types and use the multiplier function in the algorithm structure.

3-Preparation of data: Our data were divided into two types: Training data with different learning styles and test data with a ratio of 70% and 30%, respectively.

4-Data exploration and detection of each outlier and categorize the supervised learning during the system implementation, so that we will be able to iterate the process and develop it according to the agreed goals. As a result, we used the education discovery phase to fine-tune the attributes and rearrange the weights of the algorithm.

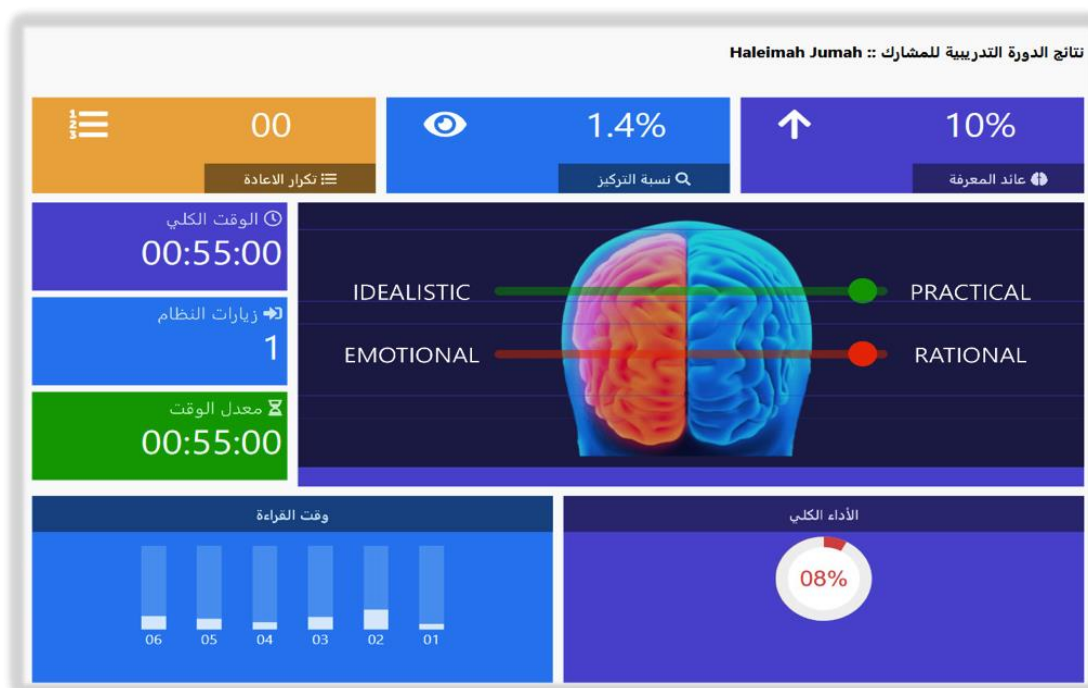
5-Building the model in which it is creating the Docker to be able to connect it directly to the system. As a result, we assure that building this model will demonstrate a significant power to improve learning outcomes and build the required behavioral skill extraction report. The processes of implementing a particular API, for example: Speech Recognition, Object Recognition. In this phase, we can test the level of decision support system that we have integrated into the learning system.

6-Model Evaluation: to ensure our system meets the needs of different learning types and levels, we conduct evaluation for different types of clusters: CEO, C-level executives, students, and operational staff. At this stage, we consider all candidates who participated in the courses and sessions as a sufficient sample size to verify the effectiveness and efficiency of the system. This model has some features that are highly beneficial for continuous and sustainable development, such as, Interpretability, Data efficiency, prediction limitations, and training, where we overcome this challenge by using a sample size of 1000 candidates from different cultures and values.

7-Deployment and Implementation: we ensured that we connected each API with its associated required attributes to measure each goal of the system and draw a conclusion. During the deployment phase, we ensured that the connection to the web-based interface was correct and functional and tested this broader ecosystem around our model. There is always a monitoring responsibility taken as a checkpoint for system performance and fit for purpose, such as: WEBUI interface to access the model, integration of model deployment, regular cross validation process developed and implemented by Rapid Miner.

This type of analysis results in a comprehensive report that identifies and analyzes the overall skills acquired during the implementation of a course. As shown below:

Picture 1: Implementation of a course skills acquired



## DISCUSSION AND FINDING

All the improvements in measuring and diagnosing competency challenges will help us build a more agile and adaptable content management system in the long run, with a high level of integration and compatibility with intelligent Big Data. The key competitive advantage we need to look for in the I-learning system is: how can we measure candidate performance and ensure that we can extract the other embedded competencies through an intelligent system. At the same time, we need to minimize the cheating rate by using various smart tools such as cell phones, tablets, etc. In addition, we need to ensure that candidates live and work in a healthy learning environment throughout the learning cycle.

Picture 2: Competencies through an intelligent system



The main benefits of Education 4.0 are related to the digital, virtual, and smart revolution for teachers and other stakeholders. Some teachers believe that the philosophy of personalized learning involves a lot of work; however, they can still meet the specific needs of students.

With the help of this technology, the teacher can teach the students instead of the class. Teachers have used various techniques and tools to help promote personalized learning. This leads to improved learning outcomes for students and better educational outcomes overall. Digital technology facilitates the work of educators and teachers by providing the best techniques to make their work easier. It also enables effective communication between teachers and students and reduces the administrative burden by automating and modernizing various teaching methods.

The use of AI and future management tools in LEARNING MANAGEMENT SYSTEMS to improve student learning performance is directly related to the use of Education 4.0. It is useful for student advancement and improves student learning outcomes. Students are considered as key stakeholders or beneficiaries of the education ecosystem. Learning 4.0 enables better connection between students and other stakeholders in the form of improved communication between parents, teachers, and management. The results of improving learning because mainstream methods and tools enable effective learning compared to traditional teaching methods. The learning style is very dynamic and increases student interest and leads to better learning outcomes overall.

Machine-human collaboration reduces the disconnect between sociological and humanistic disciplines and between innovation teacher skills and science to improve student learning outcomes. The possibilities for using artificial intelligence in teaching are many. The most important innovative feature of artificial intelligence in education is automated assessment, with one of the biggest current challenges for teachers related to quizzes and students specifically in large classrooms. Several questions can be automatically corrected and, in the future, the system can be extended to the assessment of essays (Gonçalves, et al 2017).

Another obvious advantage of this system is the personalized learning experience for students. Individuals prefer a tailored learning methodology. In this area, the role of artificial intelligence is of great importance. AI-centric tools respond to individual student needs by providing greater focus on specific topics through content repetition and helping students learn at their own pace. In the future, the advancement of AL will lead to the ability to adapt improved learning programs that lead to more gamification and personalization in the learning process (Zhang, Ueng, Studer & Burg 2020).

Huang et al. (2020) noted that AI helps improve pedagogy and instructional content. AI can collaborate with analytics that provide recommendations for designing courses and other education-related content for teachers. Based on analytics that use mass student data analysis, creating patterns leads mainstream students to find this concept very difficult. Based on analysis based on bulk data of students, pattern creation leads to highlighting the difficult concept for students. It can be processed by the AI machine to suggest particular improvements to the relevant teachers.

The development of Charbot can be perceived as a virtual mediator and teacher. The potential system of AI improves the possibility of learning in any place in the world. It also enables the choice of automated chatbots or virtual tutors. In the future, AI-centric programs will enrich and expand the range of learning services. AI is useful and promotes the growth rate of Education 4.0, and a key requirement of the revolution is based on improving human capital and the ability to meet skill and knowledge demands. It puts the demand for the production of knowledge and innovative knowledge application specifically in the period of crises COVID 19.

The main feature of Education 4.0 is related to the introduction of team-centered innovation practices. AI provides support in delivering learning content that can lead to innovation. Direct learner input as the main stream of emergence of innovation services such as predictive analytics, machine learning, and chatbots. It can be amplified through positive feedback loops against innovation and operate 24/7 in creative ways across all phases of work, learning and life. AI-powered learning provides support for continuous feedback to improve learning.

Global connectivity and continuous development of AI-based learning systems can innovatively augment anytime learning. In the future, the interplay of AI in education can lead to the desired goal of developing Learning 4.0 (Lima-Junior, & Carpinetti, 2020).

## CONCLUSION

The study concludes, digital technology facilitates the work of educators and teachers by giving them the best techniques to make their job easier. Individuals prefer a customized learning methodology. In this area, the role of artificial intelligence is of great importance. AI-centric tools cater to the individual needs of students by enabling greater focus on specific topics through repetition of content and helping students learn at their own pace. In the future, the development of AI will lead to the adaptation of improved learning programs that result in greater gamification and personalization of the learning process. The purpose of this study is to investigate the impact of e-learning through the use of AI and Future Management Tools in learning management system in COVID 19.

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